

# The Australasian MANUFACTURER

SERVING ALL INDUSTRY

Vol. XXIII — No. 1778

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AP1-13



## AFTER BUSINESS HOURS

### "The Philosopher's Stone"

By D. Harold Kemp, B.Sc.

The views expressed in articles published in this section are those of the contributors and not necessarily those of "The Australasian Manufacturer." They are selected for their interest value, whether controversial or not, and the comments of readers on the subject discussed are always welcomed by the Editor.

IT was recently reported that the Chinese gold hoarders were in a panic. The news had reached them from America that the "Philosopher's Stone" was at last working its miracles and transforming lesser metals into gold. The search for the secret of making gold had ended, not in the wave of a magician's wand or the mysterious mists of Alchemy, but in the vast Atomic Energy plants of America.

Bad luck for the hoarders of gold in China, or anywhere else for that matter; bad luck for the sunburnt old prospector who has spent his lifetime searching for the noble metal. But worst luck of all for the economist if he has to

revise the basis of the whole economic set-up.

The quest for a formula which would change other substances into gold was an adventure that occupied the minds of philosophers, alchemists and magicians throughout the ages. It appears, according to some authorities, that the old Roman Emperor Diocletian, back in 290 A.D., burned the books of the Egyptians which contained all the secrets concerning the transmutation of the common metals to silver and gold; and for nearly sixteen hundred years alchemists have been trying to re-discover the secret formula.

Just at a time when the gold

hoarders in China were beginning to feel confident that there wasn't such a thing as the "Philosopher's Stone," and devaluation had increased the price of gold, the stunning news came from America that the only thing that is necessary is a few neutrons of the right velocity and an atom-splitting machine.

You can't altogether blame the old alchemists if they missed the secret. They were constantly being led up the garden path by quacks and charlatans who claimed to have discovered the method, usually involving the use of the all-powerful "Philosopher's Stone." One of them described it as "a very fine powder, impalpable to the touch, sweet to the taste, fragrant to the smell, in potency a most penetrative spirit, apparently dry and yet unctuous, and easily capable of tingeing a plate of metal. If we say its nature is spiritual, it would be no more than the truth; if we described it as corporeal, the expression would be equally true."

Then, too, there was the other thing that confused them, just as it confuses a number of people today. They didn't know what they wanted most—the "Philosopher's Stone" so that they could make a lot of money, or the "Elixir of Life," which, they claimed, would prolong life indefinitely.

Most of the time the alchemist mixed up the two aims and made increasingly extravagant claims. The old books by the philosopher-alchemists teem with recipes for substances that will not only transmute metals but make precious stones, prolong life, cure diseases and control spirits. It was all a lot of over-ripe wishful thinking.

Part of the trouble was that the idea had spread that all matter was composed of one substance, and that gold was the noblest and purest form of matter. The idea still persists in a more abstract form to-day. For many centuries it was thought that there was some supernatural connection between the seven metals—gold, silver, copper, iron, mercury, tin and lead—and the seven heavenly bodies—the Sun, Moon, Venus, Mars, Jupiter, Saturn and Mercury. In fact, the number seven was regarded as a sacred number.

Old Chaucer, in his "Canterbury Tales," refers to this connection

between the metals and the planets:

"Sol gold is, and Luna silver we threpe.

Mars iren, Mercurie quyk-silver we clepe.

Saturnus leed, and Jupiter is tyn. And Venus copper, by my fader kyn."

The popular starting point in the quest for the "Philosopher's Stone" was a mixture of sulphur and mercury—sulphur probably because of its yellow colour, and mercury because of its metallic lustre.

The earliest known case of this peculiar kind of gold fever, strangely enough, comes from China. About 122 B.C. a magician at the court of the Han Emperor proclaimed his prowess, saying: "I know how Cinnabar (Mercury Sulphide) transforms its nature and passes into gold; I can bestride the hoary crane, and visit the nine degrees of heaven" (not that this latter capacity had anything to do with making gold, but it was apparently thrown in to impress the Emperor—and undoubtedly did so).

Further, he gave the Emperor some details and advice about the subject: "If you will sacrifice to the furnace, you will be able to transmute cinnabar into gold. When the gold shall have been produced, you may make of it utensils for eating and drinking. Through using them your life will be prolonged, so that you may see the blessed immortals of the island of P'eng Lai."

You can imagine what happened to the court magician when he inevitably failed to deliver the goods. In those days royal vengeance was apt to be swift and merciless. I don't know what was the fate of our Chinese boaster, but in 1709 the King of Prussia hanged an Italian alchemist and ordered the gallows to be gilded as a warning to those who failed to keep their promise. It is said that Frederick of Wurzburg maintained a special gallows, solely for the purpose of hanging alchemists. The failure of the quest did not deter men from all walks of life asserting their belief in the magic stone of the philosophers. Albertus Magnus, in the 13th century, said: "I find abbots, superiors, canons, physicians and many unskilled folk practising the art."



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Although the human race has spread over the wide face of the earth and acquired a great variety of characteristics, the search for wealth and the secret of long life is an aim that is common to all. From the Chinese and the Hindoos to the learned men of the Middle Ages in Europe, it was gold that attracted them. This noble metal, which has been prized for its beauty since man's eyes first caught its glitter amongst the drab earth which gave him a primitive existence. The desire to prolong life was the first motive in an age when the man who lived to see thirty years pass by was an exception. In a time when the supernatural appeared to be present in everything, it probably was not surprising that gold, the outstanding substance known and handled by man, should be endowed with an array of attributes.

The economics of the matter didn't seem to worry the old alchemist. He thought that if he could find the "Philosopher's Stone" and change the base metals into gold, the secret would remain with him. The prospect of a departure from the "Gold Standard" didn't concern him in the least.

The search for the "Philosopher's Stone" reached its height during the Middle Ages. "The universal medicine for all imperfect metals," according to Roger Bacon, who was a sensible fellow in many other respects, was able to transform base metals into a thousand times their weight in gold. Unfortunately, Roger confined himself to the statement of his belief and didn't attempt to put the matter to the test.

There was a popular idea that metals started from seeds and grew steadily while they were in the ground. Even down to the sixteenth century A.D. mines were closed up every now and then to allow the metal to grow more rapidly and yield a greater supply.

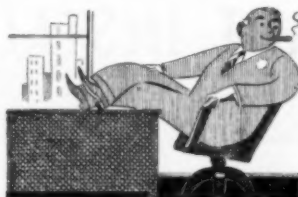
The old Alchemists believed that what nature did in her own good time they could do more rapidly in their workshops. In these days of synthetics, we use much the same sort of reasoning, and with a considerable amount of success. When the alchemist poured a strong acid on a piece of copper, a green liquid would result. Into this liquid he would dip a piece of iron. The copper would reappear out of the solution, and the iron would dissolve. To the observer the explanation was very simple—he concluded that the iron had changed into copper.

The idea that nature propagated metals in the earth and that all metals were of the one species in a different stage of evolution to gold, was expressed in Ben Johnson's play, "The Alchemist," written in 1610. One of the characters named Subtle, who is a magician, transforms metals into gold; another, called Surly, who watches him, is not convinced that his tricks are genuine.

Subtle explains: "No egg but differs from the chicken more than metals in themselves."

Surly argues: "That cannot be. The egg's ordained by nature to

(Turn to page 23.)



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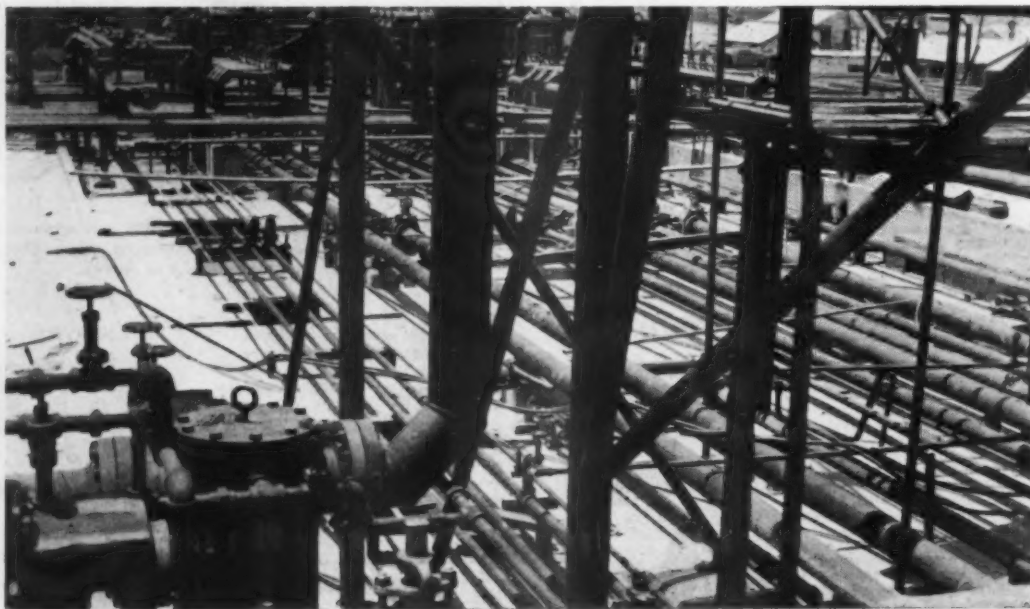
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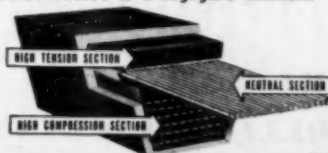
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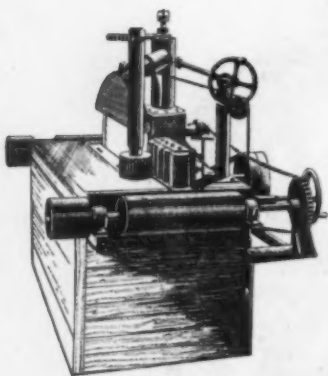
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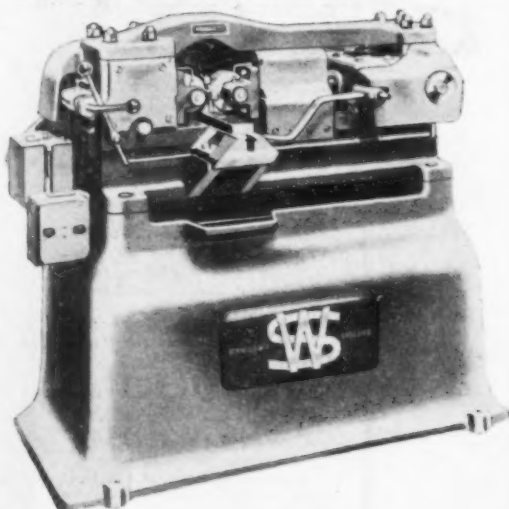
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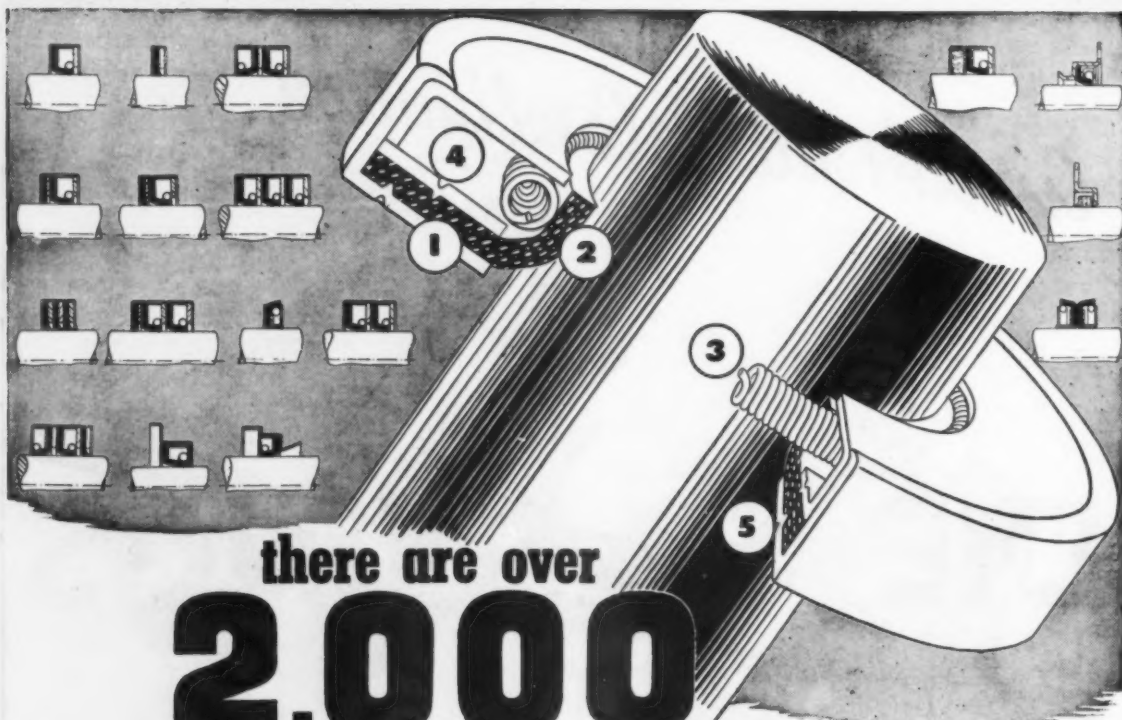
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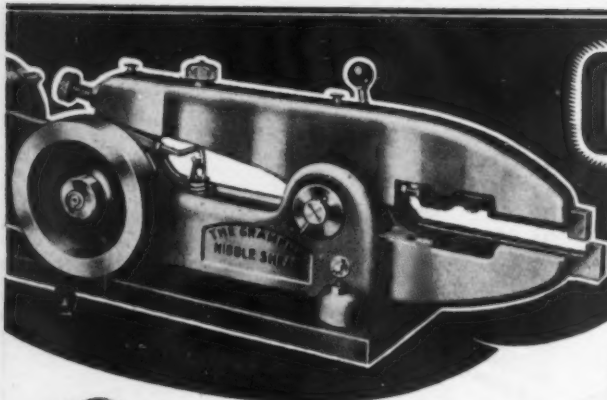
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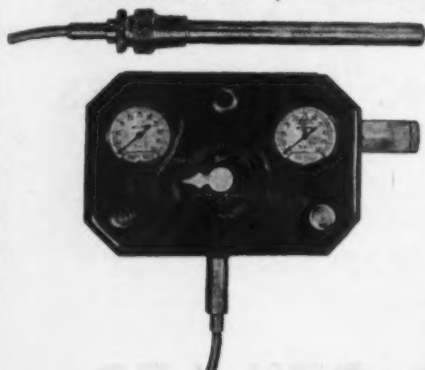
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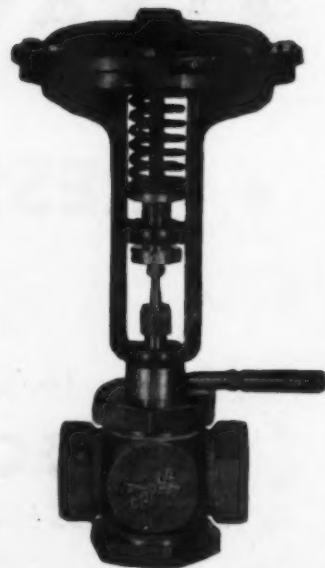
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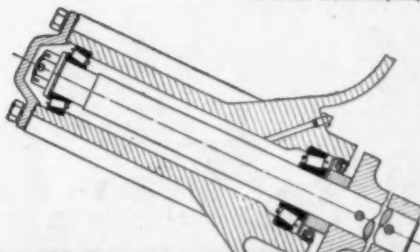
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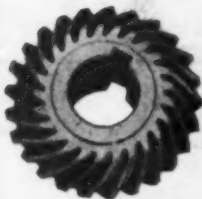
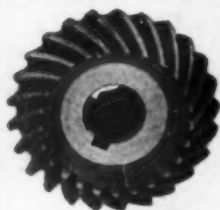
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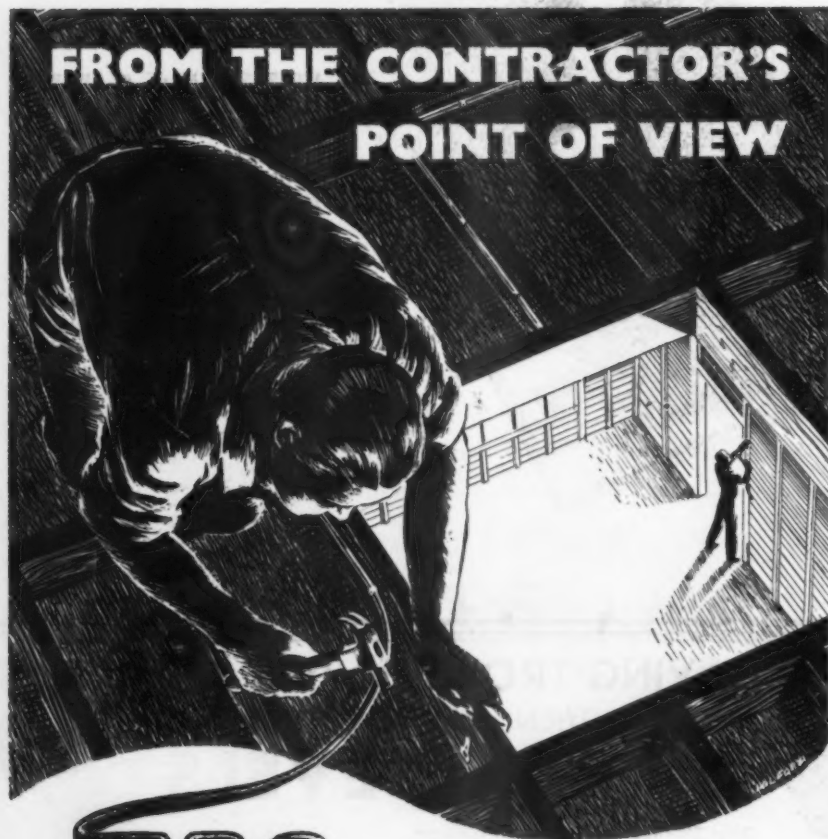
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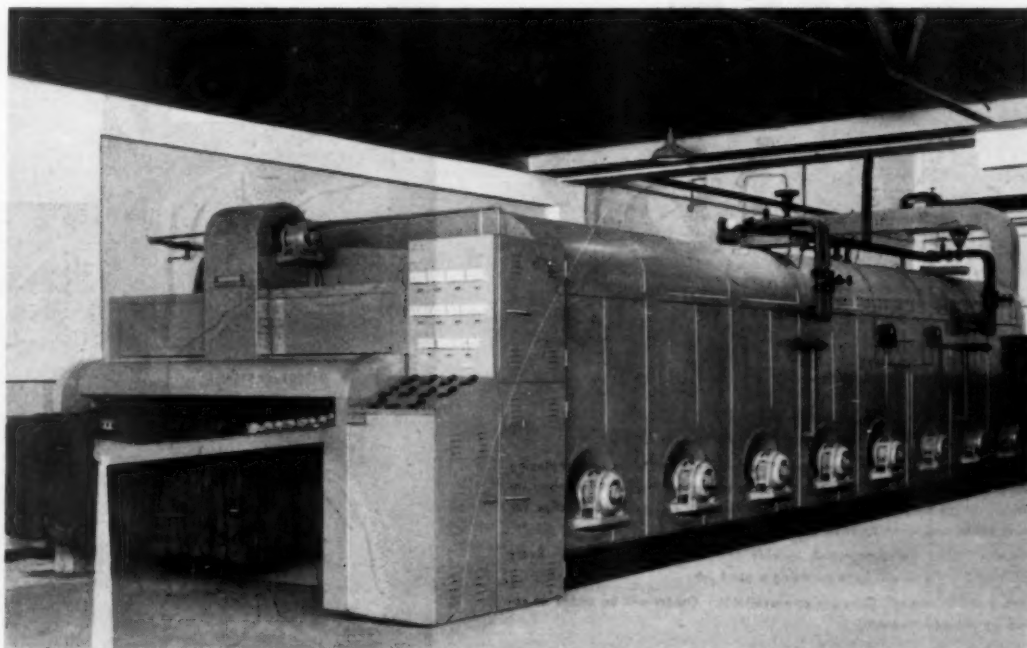
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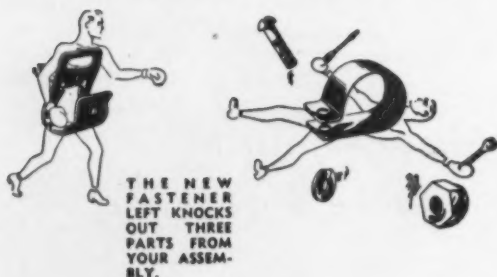
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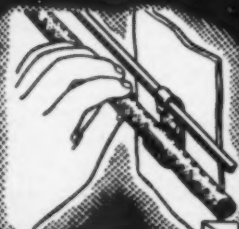
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■ Australia's National Manufacturers' Newspaper circulating in all States, New Zealand and Overseas. A weekly newspaper devoted to industrial efficiency and the manufacturing progress of Australia. Subscriptions within Australia and New Zealand (including Annual Number), £1/10/-; Great Britain and Possessions, £2; Foreign, £2/10/-. All subscriptions payable in advance.



PAGE FIFTEEN APRIL 29, 1950.

## Leadership's Responsibilities Urgent Need of Their Effective Discharge

Leadership in any field of human endeavour carries with it high responsibilities. In the industrial field, for example, the leader is charged with the responsibility of providing high quality equipment, with its corollary of high standard working conditions; of attaining high levels of efficiency; of arousing in high measure the team spirit; and, finally, of disseminating far and wide a keener knowledge and a higher appreciation of the advantages of the private enterprise system as it operates in the great Democracies of to-day.

THIS last-mentioned responsibility is receiving vastly increased attention at the hands of many of the world's outstanding industrial leaders. Indeed, one of the most eminent of these, the American, Philip D. Reed, President of the International Chamber of Commerce, ranks its effective discharge as perhaps the most significant of the many highly significant tasks confronting the industrialists of this year of grace, 1950.

Both as an international businessman, accordingly, and as Vice-Chancellor of the Board of Trustees of the Committee for Economic Development, U.S.A., he is conducting a vigorous campaign whose objective is the inducing of men of industry and commerce to give to the people of their own country in particular and to the people of all free countries in general a deeper understanding of the free enterprise system under which they live and have their being.

An excellent example of his propaganda is the extremely thought-provoking article, "Businessmen Have a Job to Do", contributed by him to the latest number of "Review", published by the Institute of Public Affairs, Victoria.

He emphasises at the outset that the explanation of the ignorance of the fundamental facts of the present-day economic scheme of things on the part of the adult population is due to the circumstance that nowhere in their life's experience have basic economic facts been adequately explained to them. "The truths that every businessman must know if he is to remain a businessman", he declares, "are truths he has, in almost every instance, learned the hard way in the course of his business experience. And yet we businessmen are surprised and resentful that workers and our neighbours in other walks of life do not instantly reject the attractive but unsound proposals made to them by certain politicians and Labour leaders."

Mr. Reed then goes on to express the opinion that the real reason for this lack of understanding on the part of the average man and

woman is traceable to the fact that the overwhelming majority of businessmen consider they have discharged their responsibility to society by producing a useful product profitably. "Too many businessmen," he continues, "regard as extra-curricular or pro bono publico or just plain wasted time and money anything they may be doing to support studies and educational programmes aimed at creating better understanding of the American economic system. Too many businessmen have been wearing mental blinders which exclude from their line of vision and effort everything but the day to day tasks of operating their business under conditions as they find them. They aren't happy about the conditions and realise that they are getting worse, but that they have either the capacity or the responsibility to do something to correct the situation rarely occurs to them. They are like the farmer who ploughs a fine straight furrow and grows a rich and plentiful crop, but fails to note or raise a hand against the cloud of locust which, unless destroyed, will strip his fields."

He then lays it down that of all people in any Democratic community, the businessmen are the logical, indeed, the only, ones who possess the knowledge, the incentive, and the resources to undertake the task of adult economic education. "Here, in my judgment," he says, "lies the great hope of the survival of enterprise. . . It must be part of our educational programme to make perfectly clear that business wants and favours adequate security against voluntary unemployment, old age, disability, etc. But we must point out that for the Government to promise such security is meaningless unless the economy of the country is sufficiently vital and productive to provide the products that will make the promise good."

Obviously, Mr. Reed stresses the fact that social and economic progress are not only twins, but are, indeed, Siamese twins, one being unable to live or grow faster than the other. "In a steadily rising national production of goods and services," he reiterates, "lies the only

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hope of social progress. Many of us know these things, but too many millions do not. Nor do they understand how increased production is achieved." This achievement, he maintains, is explainable by the fact that the arm of the worker has been "lengthened" by his employer providing him with power tools and specially designed production equipment which, with less effort and less skill and with shorter hours enable the worker to produce many times what he could produce with his hands or obsolete tools. In addition, expert design of the product and skilful layout of the plant provide the worker with the maximum opportunity of spending his working hours actually producing. "In short," he says, "by placing expensive tools at his disposal and by using the most efficient factory and production methods, the worker can produce more products per hour and therefore justify a higher wage for himself than would otherwise be possible. If this point were clearly and widely understood, labour, even more than management, would be championing the cause of adequate incentives to investment in new and improved tools and equipment."

Turning to incentives, he insists that the whole question must be reduced to simple, understandable terms, holding that it is incentives plus freedom that distinguish a free from a slave state, a vital growing economy from a static one. He contends, moreover, that the worker, the management, the investor, and the customer must all be provided with an inducement, a lively self-interest in doing his part more fully, more

effectively, and more efficiently than ever before.

The urgent need of the moment is unquestionably the widespread dissemination of knowledge of this character. Mr. Reed assures us that more and more companies in his country are charging a senior officer with the responsibility for this educational work and that as a result things already are beginning to happen.

As experience down the years has shown only too clearly, ignorance of and apathy towards economic questions rank among the deadliest of Democracy's diseases. The development of honest objective studies, not by economists, but by business leaders themselves is, in Mr. Reed's opinion, the first urgent forward step. And the second is the spreading of the results of these studies among educational authorities, Governmental authorities, employees, their families, their neighbours, and thought leaders throughout the nation.

He contends, finally, that it is essentially an individual company job that will be accomplished only when businessmen recognise and accept their responsibility to take such action as is best calculated to lift the economic literacy of the country to which they belong.

This is a clarion call to the businessmen of Australia as it is to the businessmen of all nations.

Will the businessmen of this young land respond to it with the enthusiasm, the earnestness, and the zeal which ever have characterised their response to a call for national action?

# Pithy Jottings of Industry and Industrialists

## NOYES (MELBOURNE) MANAGER RETURNS.

Mr. L. C. Scarborough, Manager of Noyes Bros. (Melbourne) Ltd., has returned from an extensive tour of America, Great Britain and the Continent, having visited many manufacturing firms in these countries, also having investigated the possibilities of trade in the future. The latest developments in manufacturing methods were studied together with the trends of television in all countries.

## B. G. E. STAFF APPOINTMENTS.

Mr. William W. Gunn, has been appointed Manager of the Company's Perth Branch.

Mr. Gunn joined B.G.E. in 1936 as a lighting engineer and for the past ten years has been N.S.W. manager of the B.G.E. Fluorescent Lighting Department. He is a Fellow of the I.E.S. (Aust.), and also a member of the I.E.S.

(Eng.). He has taken an active part in the affairs of the Society in Australia and for many years was a member of the Council.

Mr. Harold D. Ritchie, who arrived in Australia some two years ago direct from the Cardiff Branch of The General Electric Co. Ltd. of England, where he was Lighting Engineer for the South Western district of the G.E.C. organisation, has been appointed to succeed Mr. W. W. Gunn as manager of B.G.E. Fluorescent Lighting Department. He is a registered lighting engineer of the I.E.S. (Eng.).

Mr. Ritchie has been in the service of the G.E.C.-B.G.E. organisation for the past 24 years, with the exception of six years which were spent in the British Army.

## IMPORTS FREED.

Senator N. O'Sullivan, Minister for Trade and Customs, last week

issued a list of goods freed from import licence control. As the list includes many products already manufactured in Australia, manufacturers are advised to secure a copy of the complete schedule from the Customs Department.

## PRODUCTION OF MOULDS AND DIES.

With the object of providing finance for the expansion of its subsidiary (Standard Tool Co. Aust. Pty. Ltd.), 50,000 ordinary £1 shares have been issued by Pierwood Engineering Co. Ltd. The subsidiary will engage in the manufacture of moulds and dies and is allied to the largest manufacturer of these products in the United States of America—Standard Tool Co. of Leominster, Mass. The president of the U.S.A. company, Mr. L. Kavanagh, who was recently in Australia, has joined the board of

the Australian company, together with Mr. J. A. Kavanagh. Mr. H. T. Piercy, of Precision Engineering Co., is also a director.

## TWO NEW VICTORIAN FACTORIES.

Moulded Products (Australasia) Ltd. announce that production at

## "MANUFACTURER" INDEX

The index covering all issues of "The Australasian Manufacturer" from April 1, 1949, to March 31, 1950, is just off the press. It has been compiled for the use of libraries and for such industrial undertakings as regularly keep the journal on file. It constitutes a speedy and accurate means of locating articles which have appeared as Editorials, in "Around and About the Factory," in "Industrial Equipment News," in "After Business Hours," and in the general section. Will subscribers requiring copies please make early application. They will be despatched immediately on request.

their new factory at Frankston, near Melbourne, is expected to commence at a very early date. The new plant at Lilydale is also nearing completion. Here, the company will manufacture plastic wires and cables.

At the recent annual meeting of the company, the chairman, Mr. E. V. Nixon, declared that orders on hand at the moment are the largest ever held, despite the large quantity of British plastics on the Australian market. "Many new 'Moulded' products," he added, "are now coming on the market." The fact that they are holding their own so splendidly against British competitors is, indeed, a matter of justifiable pride to Moulded Products Ltd.

#### NEW WORKSHOP MANAGER.

Mr. Clyde Jenkin has recently been appointed as Manager of the Queensberry Street Reconditioning Workshop of A. G. Healing Ltd., Melbourne.

An enthusiastic devotee of motor cycle racing, Mr. Jenkin, who has spent most of his life in the automotive trade, commenced as a lad with Alfred Adams & Co., graduating through a partnership with his brother to sole ownership of an East Malvern garage.



Mr. Clyde Jenkin.

After a short period as Works Manager at Stillard Motors, Deniliquin, Mr. Jenkin became an army instructor. Commissioned as a Workshop O.C., A.E.M.E., he finally took charge of Trade Repairs Inspectors. After demobilisation he spent several years as Works Manager of Regent Motors, South Melbourne, before joining A. G. Healing Ltd.

#### DEATH OF PERRY'S WORKS MANAGER.

Mr. J. Rew, Works Manager of Perry Engineering Co. Ltd., of Adelaide, who died last month, had been with the company for 25 years. In 1923 he was appointed to the erection department and until 1939 he carried out major erection programmes throughout Australia. He then became manager of the structural division. In 1946 he was appointed production manager and in the following year assumed the responsibilities of works manager.

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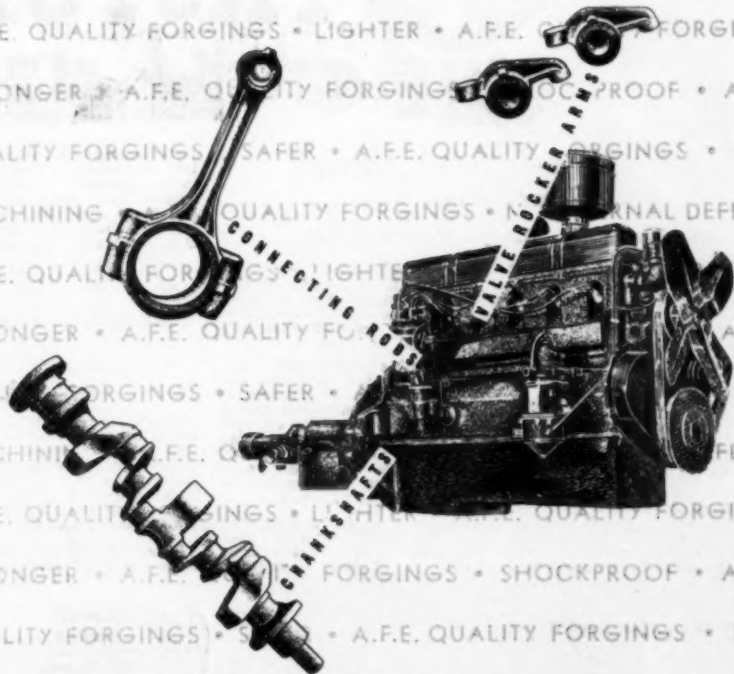
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# Around & About the FACTORY



A digest of new factory and plant construction, additions, alterations and improvements, and operating news of Australian industry.

## Electric and Petrol Driven Rotary Tools

Distribution by Rotary Tools Pty. Ltd.

For country users, or where it is not convenient to employ electric current, Rotary Tools Pty. Ltd. announce that they are distributors of the Petroflex unit which provides a portable power source of exceptional efficiency for use with flexible shaft driven tools.

Driven by a 1 h.p. motor conveniently mounted in a protective easy to handle framework, the Petroflex permits the rapid drilling of holes of up to 1 in. diameter in wood or steel and is invaluable for construction work of all kinds. Other uses with special attachments include cleaning rust from bridges, decarbonising engines, sanding, rubbing down, polishing and boiler cleansing—as well as grinding, finishing, buffing and general repair and maintenance work.

A further application of the Petroflex is the fitting of a concrete vibrating head for use in

trade, Rotary Tools Pty. Ltd. specialises in the supply of flexible shaft machines of all types and the hundreds of attachments which are available for this handy type of power.

Distributing "Morrisflex" electric flexible shaft machines, this Company carries a particularly wide range of accessories and is always ready to advise on special adaptations. Servicing and repairs for all types of flexible shafts are also carried out and a full range of replacements is kept on hand at all times.

The range of machines includes the "Morrisflex" universal floor type machine in 3 models from 1/2 h.p. to 1 h.p., covering a

pany includes "Morrisflex" cleaning, deburring, polishing and buffing spindles, industrial wire brushes and rotary rasps, files and burrs and "Rex" cutters. As all fittings are interchangeable throughout, it is possible to

begin with one unit and gradually build up an extensive flexible shaft equipment to cover every workshop need. All enquiries should be addressed to Rotary Tools Pty. Ltd., 595 Elizabeth Street, Melbourne.

## Transfer, Injection, and Compression Mouldings

Executed by Walter Barr Pty. Ltd.

The plastics industry, although one of the latest entrants into the field, is, nevertheless, constantly on the look-out for newer and better methods of production. It is not content to be modern today; rather does it aim to be ultra-modern to-morrow.

Hence there are continually being evolved newer raw ma-

terials and their technique in this particular branch that we recommend its study to makers of parts held to close tolerances and with a number of accurately positioned inserts, confident that such study will result in the makers of these parts, seeking to have them produced by transfer moulding as executed at the Walter Barr plant. This process has proved itself particularly adaptable to the production of close-fitting, dense, homogeneous components with a minimum of flash.

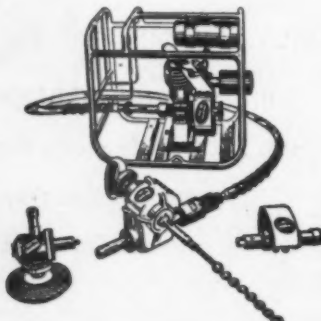
Their injection mouldings are also breaking vital new ground, it having been demonstrated that thermostatic injection mouldings are characterised by the following main attributes:—(1) Superior appearance. (2) Increased selling appeal. (3) Economy and speed if process is suited to product's design.

Perhaps, however, their greatest achievements are in the field of compression moulding, having pioneered certain processes in Australia. For example, one of their products, a floor polisher housing (cotton flock filled, medium shock-resistant phenolic, in walnut finish) was the first moulding of its type to be produced within the Commonwealth.

Manufacturers seeking components or accessories in any of the different plastics will do well to confer with Walter Barr Pty. Ltd. This move will mean their getting the benefit of a sound engineering approach to their problems, benefits which will spell savings in costs, economy in mould designing, scientifically controlled production techniques; intelligent selection of raw materials, raw materials possessing the correct mechanical, electrical, or chemical properties for the purposes for which individual products ultimately are to be used.



The "Biflex" (electric) machine, 1/2 H.P., to run at speeds of 1,600 and 9,600 r.p.m.



The "Petroflex" machine for flexible shaft power, where there is no electricity.

concrete constructional form work.

A valuable feature of the Petroflex is that the gear box can be used with a "Morrisflex" Standard Electrical Machine wherever electricity might be available, thus extending the scope of the outfit considerably.

Founded by Messrs. R. J. Chapple and S. G. Dewar, who have had more than 20 years' experience in the engineering

wheel range from 4 in. to 8 in. These machines may be operated at speeds of 1,100, 2,800 and 6,000 r.p.m. Mounted on ball bearing swivel castors, they are supplied with heavy duty rubber covered shafts and "H" type general purpose handpieces. All components are interchangeable.

Besides a large range of portable bench and suspension type machines, the extensive range of attachments stocked by this Com-

pany includes more efficient plant and equipment; and improved manufacturing techniques.

In this forward work, the enterprise of Walter Barr Pty. Ltd. (a Division of International Products Ltd.), Gillespie Avenue, Alexandria, New South Wales, is playing a part of outstanding importance.

Take, for example, their work in the sphere of transfer moulding. So efficient and so reliable



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Prior to the war there were a number of pruning shears on the market which were quite suitable for the occasional gardener—but which were found to be of little use to the orchardist, or for cutting-back operations in vineyards—as they were generally constructed of materials which did not stand up to continuous use.

Attempts by orchardists to use these proved uneconomical, and finally Mr. F. W. Code was approached to design shears of sufficient robustness and with wearing qualities to fill the needs of the man on the land. That he did this successfully, is evidenced by the demand which exists for Code pruning shears—both within the Commonwealth and on the export market.

With the finished design arrived at after submitting a number of experimental models to sustained practical tests in orchards and vineyards, the Code pruning shears are made entirely from selected alloy steels, including forged bodies, etc.

Of the most sturdy construction, these shears are designed for years of wear and have found wide application in the dried fruit industries, as well as by authorities controlling large parks and gardens.

Also the best procurable for the home gardener, they are designed, however, primarily for heavy service conditions and it is proposed in the near future to produce a model of lighter construction which will stand up, nevertheless, to the heaviest normal use of the "home gardener."

Produced in the extensive plant of F. W. Code at 100 Little Lonsdale Street, Melbourne, and in Evons Lane, these shears form only a small part of the output of this factory, which is also engaged in the production of a large variety of proprietary assemblies and precision components for nationally distributed products.

With many years of intensive research devoted to the production of small, accurate forgings—and to improving plant for this type of work—F. W. Code is in a position to meet the demands of manufacturers for all types of small brass and steel forgings of high precision.

With two drop forging units built to his own design working to capacity, Mr. Code has established a modern tool-room for the production of tools and dies to the highest standards of accuracy for use in his plant.

On every hand may be seen machines of novel design which have been evolved by Mr. Code, especially for this exacting type of work. In this way it has been possible to break new ground in producing articles and components for the trade which combine utmost precision with reasonable cost.

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Always ready to offer suggestions as to the best and most economical methods of producing components for manufactured articles, Mr. Code is frequently able to adopt new methods of production offering outstanding improvements in design, which do not increase, and frequently reduce, the cost of the finished article.

All enquiries should be addressed to F. W. Code, 100 Little Lonsdale Street, Melbourne.

### STEEL ANALYSIS.

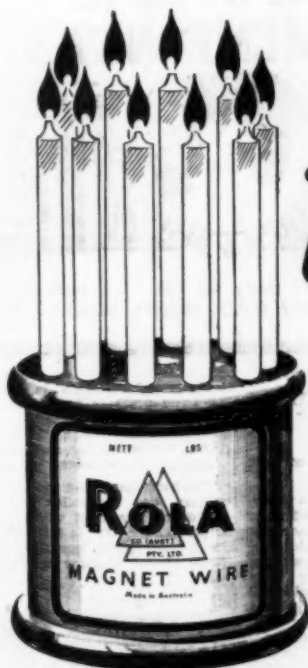
The Geiger counter, used to detect uranium and other radioactive materials by nuclear physicists, is now being adapted for use in the steel industry. Scientists of the Research Laboratory, United States Steel Corporation, Delaware, U.S.A., are using the Geiger counter to analyse steel samples, the method being both quick and accurate. Any steel part with a flat surface can be analysed.

The method is best adapted for detecting and measuring elements of medium atomic weight, such as chromium, manganese, molybdenum, titanium, copper, tungsten, and vanadium. [2444].

### TRADE BETWEEN AUSTRALIA AND ARGENTINA.

Pointing the way, it is hoped, to bigger things in the future is the recent trade agreement between Australia and Argentina under which this country will export \$500,000 worth of manufactured goods, receiving in return linseed and other oils, cotton, tobacco, and tanning extract. The agreement is the outcome of Australian initiative, especially on the part of the Australian Trade Mission which recently visited the Argentine and other South American countries. Initially, Australia plans to export agricultural machinery, general machinery and spare parts, motor car spare parts, service station equipment, X-ray apparatus, electrical goods, appliances, and spare parts, veterinary and surgical instruments and vaccines, hand and precision tools, hardware, drugs, chemical, moulding powders, mother of pearl shell, textiles, worsted cloth and yarn, rubber and its products, rabbit skins and hair.

This, indeed, is an excellent array, and "The Manufacturer" is sure its quality will win for it a splendid market in Argentina.



*We Celebrate  
a 10<sup>th</sup> Birthday*

This year makes a decade in the history of a new Australian industry — the manufacture of Magnet Winding Wires — which was pioneered by Rola Co. (Aust.) Pty. Ltd. in 1940, when, to forestall

potential war-time shortages in the Australian Electrical Industry, it installed the first units of a modern wire-making plant.

Despite the claims by some local experts, repeated at a 1941 Tariff Board enquiry, that the manufacture of Magnet Winding Wires in Australia was uneconomic, the new enterprise was a success from the start.

To date, more than 12,000,000 pounds of Rola Magnet Winding Wires have been supplied to Australian radio and electrical manufacturers and the Company is still pioneering new developments in magnet wire techniques.

Most important of all, this new Australian industry has become firmly established — there are now three independent manufacturers of Magnet Winding Wires in the Commonwealth — and Australia has made another important step on the road to self-sufficiency.



**ROLA CO. (AUST.) PTY. LTD., The Boulevard**

RICHMOND, VIC., and 116 CLARENCE, STREET, SYDNEY



YOU WANT TO KNOW . . . and the editors will gladly tell you . . . more about the inventions, materials, and processes mentioned on this page. Write to Box 1687, G.P.O., SYDNEY, enclosing a stamped, self-addressed envelope.

## Coil Feed Gives Uninterrupted Output of Small Turned Parts

The precision 5/16" automatic illustrated below is designed to produce screws and other small precision turned parts in brass or similar metal at high average rates of output with simplicity of operation. Production time is saved by an ingenious coil feed. The length of wire material on each coil is equivalent to many bars and is cleaned, lubricated and straight-

thus effecting a saving of idle time.

The revolving tool spindle carrying the two cutting tools with their operating mechanism is mounted on precision pre-loaded radial and thrust ball races, the operating movement of the cutting tools being controlled by a single bell cam through hardened and ground spiral splines. This spindle also supports the wire guide bush holder in a position immediately behind the cutting tools, thereby giving maximum support to the wire being machined, ensuring finish, accuracy and concentricity.

Patented compensating mechanism is incorporated in the tool plate, relieving the operating parts of undue strain caused by centrifugal action when revolving at high speed. The two cutting tools used are of normal standard design. In general one tool is used for the run-up or turning operation, and the other for parting off. The tool plate is provided with fine screw adjustment for accurately controlling the diameters being machined.

The camshaft is sturdily constructed and mounted on three phosphor bronze bearings. Drive is obtained through gear box and worm gear, camshaft speed being controlled by change gears incorporated in the gear box conveniently situated at the rear of the machine. An adjustable safety friction clutch is fitted to minimise risk of breakages in case of overload. A lever suitably situated at the front of the machine operates a clutch providing manual or power drive to the camshaft.

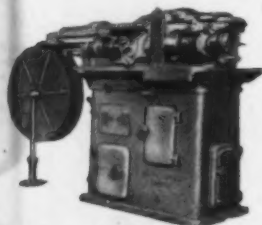
An automatic cut-out for the motor is incorporated, which operates when the wire coil is exhausted and in the event of breakage of the endless belts driving the tool spindle or screwing and drilling attachments.

General lubrication is provided by hand pressure gun through oil and grease nipples, the tool spindle and clutch mechanism being lubricated by self-contained automatically operated oil pump.

The main shaft and coolant pump motors are controlled by push button starter fitted with overload trips. The starter is flush-mounted in a convenient position at the front of the machine cabinet with

the automatic cut-out resetting lever and switch.

The slotting attachment, which is arranged in conjunction with the screwing or drilling attachments, is used for slotting or milling flats on parts produced by the machine. The parts produced are transferred by means of a pick up arm from the parting off position to the slotting saw and then automatically injected into a work tray [2440].



Precision 5/16 in. Automatic, described in the accompanying article.

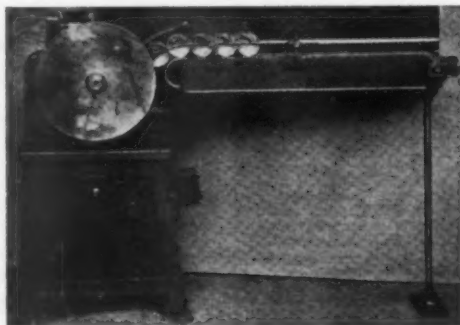
ened automatically by special devices incorporated in the machine.

The sliding head moves longitudinally on the bed, carrying the non-rotating work spindle and collet operating mechanism. The work spindle supports the collet and feed finger tube which is anchored to the bed. A bell cam controls the feed to the head, while the collet is operated by adjustable cam dogs. The wire material is rigidly held by the collet chuck incorporated in the sliding head work spindle, and by a wire grip mechanism attached to the head. The sliding head is returned to the feeding position while the parting off operation is being completed,

## Canister Code Printing Machine

The installation of a new automatic code printing machine at a suitable position in the filling line of a food canning factory ensures that only containers printed with the current code symbols are in-

tion to the type which, coupled with the mechanical action, gives a perfectly legible code impression and, being made of rubber, eliminates the risk of fractured tinplate. The type area of 11 in.



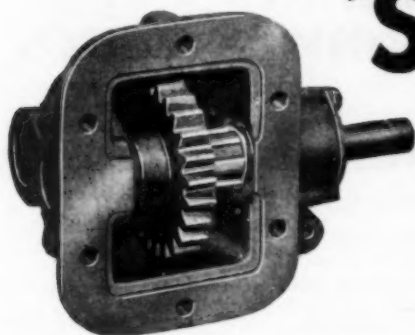
Automatic code printing machine with an output of eighty containers per minute.

cluded in the batch. Canisters from the input conveyor are accepted by the machine, which prints them on the base and ejects them on to the line conveyor, thus maintaining continuity.

The inking mechanism ensures a smooth and even ink applica-

tion by 11 in. may contain ten individual numerals or letters, and is adequate for all normal coding requirements.

The machine, which is precision built, compact, and of robust construction, will handle eighty containers per minute. [2415].



# "SERVEX" TRUCK POWER TAKE-OFFS

**CAT. No. 3050:** Applicable to all Ford, International K5 and others with Warner T9 Gear-box.

**CAT. No. 4000:** Applicable to all Bedford, Oldsmobile and also Chevrolet to 1947.

**CAT. No. 2938:** Helical gear power take-off applicable to 1948 Synchro Mesh Chevrolet and Maple Leaf.

**CAT. No. 3000 A to M.** This series is applicable to all other trucks not already mentioned.

**CAT. No. 2217 & 2218:** Adaptor used with above to obtain high speed, correct rotation and depth of mesh.

**CAT. No. 2095:** Spacers used for adjusting depth of adaptor.

1. Enable the power to be taken from the side of the gear-box to drive Winches, Pumps, Hoists, Bag-loaders and other Power-driven Auxiliary Equipment.
2. Are manufactured to suit most makes of Trucks imported into Australia and New Zealand.
3. Are made for Light, Medium and Heavy Duty Applications.
4. Are designed and built by experienced Automotive Engineers and will match up to the highest quality Truck Transmissions.
5. Are supplied as standard equipment by many Truck manufacturers in Australia and New Zealand.
6. Are available for early delivery.

## INDUSTRIAL SERVICE ENGINEERS PTY. LTD.

ASHLEY STREET, BRAYBROOK, VICTORIA, AUSTRALIA

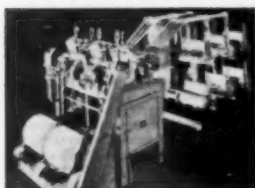
## Balling Head for Pin Drafter

A new balling head mechanism which extends the versatility of a pin drafter is now in production. The head has been under test in actual mill production for 18 months, the company states.

The dual balling unit will enable one of the manufacturer's machines to replace two gilling machines.

able to French-system operations.

The balling unit winds tight, hard balls 14 in. by 15½ in. in diameter, without draft. The balls weigh approximately 21 lb. In comparison with storage in 15 x 36-in. cans, about twice the weight of yarn is thus accommodated in the equivalent amount of space.



A balling unit adaptable to all pin drafters can assist in streamlining worsted-spinning operations. Balls weigh approximately 21 lb.

operations following combing in combing operations where commercial ball top is the final product.

The use of ball top in yarn mills operating on the Bradford system will enable two pin-drafting operations to accomplish the work now done by three pin drafters, or five conventional gilling and drafting machines. The balling head will also make the pin drafter more readily applicable to French-system operations.

A patented lifting device recently introduced can also be readily applied to pulling, stretching, and similar operations. It weighs only 17 lb. and has a maximum load capacity of 3 ton. The maximum lift is 4 ft. 6 in., and the minimum distance between hooks is 12 in., while the dimensions of the tool when packed are 20 by 5½ by 4½ in., so that it is easily accommodated in a tool kit.

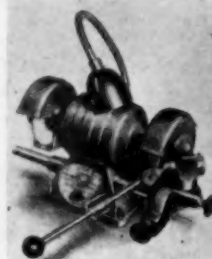
The device incorporates a precision roller chain which is fed over a chain wheel carried in the suspension hook housing. The chain wheel is rotated by a hand lever operated ratchet mechanism which is provided with raising and lowering pawls selected as required by a finger lever. The load is sustained by a brake which is automatically applied and is so designed that the load is instantaneously held without any backlash. This permits "inching" of the load in very fine increments, a feature of particular use when the part being handled is required to be accurately lined up.

The hooks are heat-treated steel forgings, and both are mounted so as to swivel. For quick adjustment the empty load hook can be raised or lowered by means of a hand-wheel provided on the side of the ratchet gear housing. The tool can be operated with as little as 5 in. of movement at the extreme end of the hand lever, an advantageous feature when it is necessary to work in confined spaces.

It is stated by the company that this device will also be available in 1½- and 3-ton sizes in the near future. [2426.]

## Twist Drill Grinder Has Built-in Light

The accompanying illustration shows a twist drill grinder recently introduced for sharpening drills from 3-32 in. to 3-16 in. diameter. Two grinding wheels are mounted at 12 in. centres on the



Twist Drill Grinder.

motor spindle, one of these being a 6 in. by 3-16 in. saucer wheel and the other a plain grinding wheel 4 in. diameter by 3 in. wide. The totally-enclosed 1-h.p. driving motor provides a grinding wheel speed of 2,800 r.p.m. A built-in light forms part of the machine equipment, and the motor control switch is built into the base. [3370.]





## SWIFT NEWSLETTER No. 38

### Announcing—

the J.C. 24/48 and J.C. 30/60

## INJECTION MOULDING MACHINES

As representatives in Australia and New Zealand for **R. H. WINDSOR LTD. of LONDON**, we are pleased to announce the availability to the Australian moulder of these two larger and different injection moulding machines.

The J.C. 24/48 and J.C. 30/60 are an entirely new design High Capacity Universal (Extrusion and Injection) Moulding Machine, enabling the moulder to use crystal "Styron," for example, and blend his own colours to produce the finished article all in one operation.

Consider the full range of **WINDSOR** plastic moulding machines:

Model	Capacity	Model	Capacity
E. 4	1 oz.	S.H. 16/20	20 oz.
H.E. 7	2 "	S.H. 24/28	28 "
H.E. 9	3 "	S.H. 30/32	32 "
S.H. 3	3 "	J.C. 24/48	48 "
S.H. 4	4 "	J.C. 30/60	60 "
S.H. 6/8	8 "	S. 35	[Extruder]

and the recently announced

Model R.C. 3 Twin Screw Compounder and Extruder.

In this list you are certain to find the machine you require.

Full details are available on request from

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## Lock Now Needs No Oil

The lock mechanisms on refrigerator doors are subject to greater punishment than those of almost any other doors. One of the largest

main objection to the metallic bolt roller was the fact that excessive wear developed between the roller and the bolt roller pin unless a sufficient amount of lubricant was present at all times. It was difficult to lubricate the roller at time of assembly with sufficient lubricant to last for the normal service life of the door lock unit.

So the company tested moulded nylon for bolt rollers and found that it was unnecessary to use any lubricant between the nylon bolt roller and the pin. A fatigue test of 500,000 cycles of opening and closing showed that the plastic rollers suffered practically no wear.

In addition to overcoming the problems of lubrication and wear, the nylon rollers cost from 15 to 35 per cent. less than stainless steel rollers, depending upon size.

Now standard with the company, over 300,000 nylon bolt rollers have been used in this mechanism to date. [2424].



Nylon bolt roller (in circle) outwears steel, needs no lubrication.

overseas manufacturers of refrigerator lock mechanisms traditionally used stainless steel for the bolt rollers in its patented lock. The

## Cutting-Off Machine Has Automatic Torque Measuring Device

Fully automatic or semi-automatic cycle of operations, hydraulically operated wheelhead, vice and work feed, and a pre-set automatic torque control of the wheelhead are features of a new abrasive wheel cutting-off machine.

This machine has a capacity in solid bar 3½ in. to 4 in. dia., tubes 4 in. dia., 9 in. by 3 in. channels and 4 in. by 4 in. by ½ in. angles, when fitted with a standard 16 in. dia. by ½ in. wheel. Abrasive wheels are made with a triangular hole to give a positive drive and eliminate scoring of spindle due to wheel slip.

Wheel is driven by a 25 h.p. motor, the hydraulic equipment being powered by an independent 2 h.p. unit. Wheelhead cradle mounting can be rotated from the vertical to the horizontal. Vice can be swung out of position and horizontal cuts made with the abrasive wheel, the height of cut being regulated by vertical adjustment of the cradle. For best

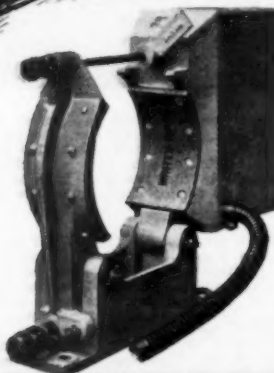
results large solids should be cut under the bottom centre of the wheel, while light sections should be cut towards the front of the wheel. A specially designed wheel guard is fitted, in which the rotation of the wheel develops a water pressure between the faces of wheel and guard so that the wheel is both cooled and hydraulically supported during the cutting operation.

Patented automatic torque measuring device in the wheel drive operates a valve controlling the oil pressure to the wheel feed. Load on torque device can be pre-set to give the required ratio of cutting time to wheel life, the load being on a visual indicator mounted on the head. Machine can be stopped at any position in the cycle.

Thin metal friction wheels can also be used for certain cutting operations on this machine, which is 7 ft. 6 in. by 7 ft. 6 in. and 6 ft. 6 in. high. Ram feed unit is 10 ft. 6 in. long. Weight is 4,800 lb. [2405].



# INSTANT STOPS & STARTS



## MINTEX

### INDUSTRIAL BRAKE LININGS

Mintex Brake Linings, Clutch Discs and Segments may be used up to temperatures of 600 degrees F., some of the most outstanding applications are for colliery winding gear, haulage equipment, oil field draw works, winches, hoists, cranes, lifts, heavy transport vehicles, centrifugals, hydro extractors, tractors, etc., and on many other types of equipment where safety, quick pick-up or stopping and reliable linings are a necessity. All aircraft in the "Battle for Britain" and every Matilda Tank that came off the assembly line was fitted with Mintex.



Telegrams. & Cables:  
"Laminated", Sydney  
Telephones: MJ4678, MA2413

**LAMINATED BELT CO.**  
106 COMMONWEALTH STREET, SYDNEY

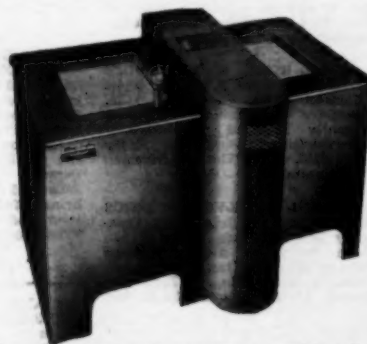
## NOW — For the First Time in Australia

### A 2-CHAMBER *Low Frequency* INDUCTION FURNACE

PROVIDING TREMENDOUS ADVANTAGES OVER ALL OTHER TYPES OF METAL MELTING FURNACES

- Reduced reject castings — increased production
- Decreased operating costs — greater profit

Lindberg Engineering Company, of Chicago, manufacturers of the world famous Lindberg-Fisher range of heat treatment and metal melting furnaces, have made history in the Low Frequency Induction Furnace field by pioneering and developing a horizontal channel furnace. Allmet Industries now present the ALLMET-LINDBERG DOUBLE-CHAMBER LOW FREQUENCY INDUCTION FURNACE, made in Australia under licence to the Chicago Company.



#### ALLMET-LINDBERG DOUBLE-CHAMBER ADVANTAGES

1.—Permits charging cold metal in the melting chamber without disturbing temperature conditions in the ladling or pouring chamber — thus ALLMET-LINDBERG is the equivalent of a combined melting and holding furnace. 2.—Double chamber construction simplifies remelting metal in case of freeze up due to power failure or other cause. 3.—Confines impurities from scrap metal to the charging chamber. Only clean metal from beneath the surface can pass to the ladling or pouring chamber. 4.—Automatic flushing action through the horizontal melting channels eliminates channel build-up and maintenance. Allmet engineers, experienced for 10 years in building Low Frequency Induction Furnaces in Australia will gladly furnish further details.

**Allmet-Lindberg**

**LOW FREQUENCY INDUCTION FURNACE**

Made under licence in Australia by ALLMET INDUSTRIES PTY. LTD., P.O. Box 14, BOTANY, N.S.W.

Telephone: MU 1543.

**SEND FOR FOLDER DESCRIBING FULLY THE ALLMET-LINDBERG**

# INQUIRIES FOR PLANT MATERIAL AND AGENCIES

"THE AUSTRALASIAN MANUFACTURER'S" INQUIRY DEPARTMENT

This Inquiry Service is for the use of readers of "The Australasian Manufacturer" who wish to trace suppliers of Plant, Equipment and Materials, and for particulars of agencies offered. Address your inquiry to the Inquiry Department, and give the fullest possible particulars to enable us to put you in touch with the best sources of supply. **INCLUDE A STAMPED SELF-ADDRESSED ENVELOPE WITH YOUR INQUIRY.** It is essential that telephone inquiries be confirmed by letter. No charge is made for Inquiry Services, but normal advertising rates will be charged if agencies are sought by manufacturers' representatives or if goods are offered for sale. For the benefit of new subscribers, inquiries will be published in two or more consecutive issues.

## SPECIAL NEW INQUIRIES.

**WHEN REPLYING** to an Inquiry, please quote the Reference Number and send your reply to the Inquiry Department, "The Australasian Manufacturer," 16 Bond Street, Sydney. **INCLUDE A PLAIN, STAMPED ENVELOPE** so that we can forward your reply to the Inquirer.

**ENGINEERING CAPACITY AVAILABLE:** A small exclusive engineering shop requires an additional small product for manufacture and assembly. They would consider enquiries from large firms who wish to off load due to lack of capacity. Write to Ref. 8154, c/o "The Australasian Manufacturer."

**STEEL TUBE AND CONDUIT WANTED:** 1000 yards of 11 in. Diameter Steel Tube and 11 in. Diameter Screwed Conduit urgently required by Sydney Manufacturing Company. Reply Ref. 8155, c/o "The Australasian Manufacturer."

**NICKEL SILVER DISCS AVAILABLE:** Melbourne Company has available about 1/2 ton each 20 gauge and 16 gauge Nickel Silver Discs, 10% soft, ranging from 2 1/2 in. to 3 1/2 in. diameter, 1/- lb. in quantity at fac-

**LATHE FOR SALE:** 15 in. Centres, All Geared Head, 4 1/2 in. Hollow Spindle, complete with 25-H.P. Motor. Splendid order. Write to Ref. 0557, c/o "The Australasian Manufacturer."

## P L A S T I C MOULDINGS

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Bring your own moulds or have new moulds made in our Precision Tool Room.

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Tel.: MX 3661

tory. Write to Ref. 8156, c/o "The Australasian Manufacturer."

**WATER TUBE BOILER WANTED:** Victorian firm urgently requires a new or second-hand Water Tube Boiler, approximately 3,000 sq. ft. heating surface and operating pressure of 230 lbs. p.s.i. If you can supply, write to Ref. 8151, c/o "The Australasian Manufacturer."

**SURPLUS WIRE AVAILABLE:** Leading firm of electrical engineers has available quantities of surplus wire stock of all gauges and makes. Prices available on application to Ref. 8152, c/o "The Australasian Manufacturer."

**AGENCY FOR PEPPER, SAFFRONS, CAPERS, ETC.:** Spanish firm of exporters, desires to contact a reliable agent for their products on a commission basis. They say they are exporters on an extensive scale of the following items: Ground Pepper (Paprika); Saffrons, Anis and Cuminseeds, Capers in brine, Medicinal Herbs, etc. If interested write to Ref. 8153, c/o "The Australasian Manufacturer."

**MANUFACTURERS' W.A. REPRESENTATION:** Are your products represented on W.A. Goldfields? Experienced Agents possessing good connections and credentials are seeking to represent Manufacturers of quality products on the Goldfields, particularly the Gold Mining Industry. Apply "Goldfields", c/o "The Australasian Manufacturer", Box 1687, G.P.O., Sydney.

## REPRESENTED IN SOUTH AUSTRALIA ?

Capacity available for representation of Automotive, Engineering, and Hardware Tools, Equipment and Associate Products.

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366 GAWLER PLACE, ADELAIDE

**AUTOMOTIVE PARTS AND GARAGE TOOLS:** Indian Firm desires to contact Australian firms manufacturing Automotive Replacement Parts, Small Hardware, and Garage Tools. Write Ref. 8150, c/o "The Australasian Manufacturer."

**ELECTRICAL INSTRUMENTS AND BATTERY CHARGERS:** Bombay firm desires to hear from Australian makers of Automotive Battery Chargers, Battery Cell Testers, Volt-Meters, etc. Write Ref. 8149, c/o "The Australasian Manufacturer."

**COPPER COATING PAN WANTED:** Sydney firm wants to purchase a 30 in. internal diameter copper coating pan, complete with rotating gears and belt drive. Write to Ref. 8140, c/o "The Australasian Manufacturer."

**MATERIAL (STEEL SHEETS) FOR EXCHANGE:** Melbourne firm desires to exchange 1 ton 75 in. x 24 1/2 in. x 22G Sunstar Black Steel Sheets, for 1 ton 3/16 in. Bright Wire, or 1 ton 3/16 in. Bright Shafting. Write to Ref. 8141, c/o "The Australasian Manufacturer."

**SHADED POLE ELECTRIC MOTORS:** Manufacturers who can supply Electric Motors, 1/20th to 1/30th H.P., 240 volt, 50

cycles, 1,400 R.P.M., in lots of 12 to 50, are requested to write to Ref. 8142, c/o "The Australasian Manufacturer", enclosing particulars and sketch showing outside dimensions. These motors are required to drive a small double worm reduction gearing, 420 to 1, ratio, on Oxy-Acetylene Cutting Machines, which the inquirer manufactures.

## NEW FACTORIES FOR GRIFFITH (N.S.W.).

Recent weeks saw the official opening at Griffith, New South Wales, of a rice mill, a starch factory, and a winery. The rice-milling plant has been installed in a building which formerly was a flour mill, while a building previously used as a cannery has been reconstructed to house the starch factory and the winery. The triple undertaking has been established by Swift's Winery Pty. Ltd.

## PLASTIC MOULDINGS, DIES AND AUTO. LATHE CAPACITY

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## ARUP AND BRUHN Pty. Ltd.

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### GERMAN INDUSTRIES FOR AUSTRALIA?

According to recent reports from Melbourne, two leading German firms are considering the establishment of Australian off-shoots. They are M.A.N. Heavy Engineers and Krauss-Maffel Ltd., which rank among the largest of German engineering enterprises, employing some 25,000 men. Colonel H. D. Bennie announced on his recent arrival in Australia from England that he has come here to start an office for an

English engineering undertaking and to investigate Australian conditions on behalf of the German firms. He pointed out, by the way, that the firms are back to 85 per cent. of their pre-war production and are seeking fresh markets. "They consider that Australia," he added, "has the best future of any country in the world."

### "SMALL BUSINESS" CONFERENCE.

The Institute of Industrial Management, Victoria, is organising a conference for the executives of smaller undertakings. It is to be held in the Melbourne Town Hall on May 30th. It will be under the chairmanship of Mr. A. H. Blamey, secretary of Griffiths Sweets Ltd. The three speakers at the gathering will be Mr. F. M. Wiltshire, managing director of the Wiltshire File Co., who will discuss the overcoming of production problems, inventory, and cost control; Mr. Justin Power, managing director of A. C. Nielsen, Ltd., Delaware, U.S.A., who will speak on the best methods for discovering the probable capacity of the market to absorb a specific product; and Mr. W. Kirkhope, who will deal with the finding of finance for expansion.

The high measure of success which has attended the Top Management Conferences organised by the Institute on a number of occasions is sure to be repeated in Melbourne on May 30th.

## Markets Available

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ENGINEERS' SUPPLIES  
HAND TOOLS  
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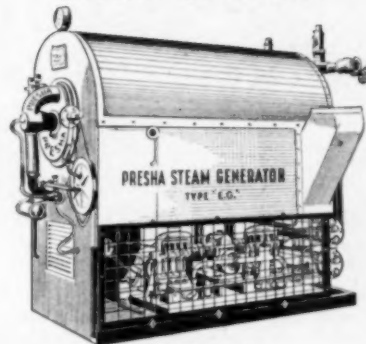
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Manufacturers' Reps.

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RELIABLE STEAM GENERATING PLANT. FOLLOW THE  
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THE "PRESHA"  
(Automatically Controlled Steam Generator)

The original and only "PRESHA" — covered by world patents, hundreds in constant use in Australia and overseas. Large and small steam users, your steam requirements of any capacity supplied — fitted with the "PRESHA" patent automatically controlled modulating fuel oil burner using diesel or bunker fuel oil — a full head of steam in five minutes — efficiency guaranteed 80% — entirely automatic in operation — unlike a steam boiler, there is no danger risk — a "PRESHA" steam generator cannot explode — entirely an Australian invention made in Australia by Australian engineers using all Australian materials and equipment.

Write at once for Illustrated Brochure.

### Just a Few of Our Many Recent Orders:

BOVRIL LIMITED, England, 8-100 H.P. Generators, total 800 H.P., for their new works on the Katherine River, North Australia.  
The COMMONWEALTH WHALING COMMISSION, 4-100 H.P. Generators, total 400 H.P., for the Whaling Station, Carnarvon, Western Australia.  
The NATIONAL UNIVERSITY, CANBERRA, 4 Generators.  
NUFFIELD ORGANISATION, SYDNEY, 4 Generators.

Ask for a list of users. Get their opinion, there is no better recommendation. "PRESHA" Steam Generators are manufactured by

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Household purposes

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\* BADGES \* MEMORIAL TABLETS  
\* BUILDING PLATES \* METAL STAMPINGS  
\* NAMEPLATES \* STREET SIGNS

100 THE BOULEVARDE & THE BROADWAY  
PUNGBOWL N.S.W.



View of the Healing Display-Mobile which is attractively ducced in three shades of red with aluminium skirting.



Interior of unit. Note sloping shelves for easier inspection.

## Travelling Display Unit

### A. G. Healing Ltd. Offer Service to Country Garagemen

FOR the convenience of country garage and workshop proprietors and staffs unable to make frequent visits to the city to keep abreast of the latest in tool and equipment design, A. G. Healing Pty. Ltd., of 167 Franklin Street, Melbourne, recently launched a new travelling display unit housed in a specially adapted bus-type body.

Featured in an advertisement in "The Australasian Manufacturer" a few weeks ago under the arresting title of "Mahomet Goes to the Mountain", this unit has created widespread interest both in the country and among manufacturers. A few details have been obtained, therefore, of the construction and purpose of this unit, and of the success which has attended its progress through those parts of Australia already visited.

Built on a Bedford chassis fitted with the latest type of passenger carrying body, the reconversion and fitting were done by Kenneth Wright Pty. Ltd., of 79 Yarra Bank Road, South Melbourne, to a design evolved by the technical experts of A. G. Healing Ltd.

As the result of experience gained during the many years

of service to country areas by the original Healing caravan placed on the road as early as 1936, this incorporates a number of improvements, and an ingenious utilisation of limited space, which has amazed those who have been fortunate enough so far to view the completed display unit.

Providing extensive floor space for a large number of heavy and bulky units such as boring bars, arc-welding

plant, drilling machines, battery charger, testing equipment, and so on, a novel feature which adds to the attractive interior appearance is the sloping shelves which have been fitted for displaying tools and lighter units.

Obviating the necessity for craning to see over eye-level shelves, these sloping racks run nearly the full length of the corridor which offers ample head clearance while allowing

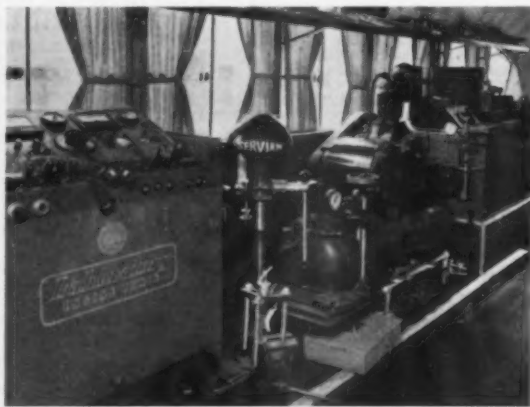
plenty of room for a number of people to view or test equipment under comfortable conditions.

Containing, as it does, a full selection of modern tools and garage equipment bearing such well-known names as Boss and Servex, Servian and Jasco, Warren & Brown, etc., the Display-Mobile has enabled owners and staffs of country garages and workshops to familiarise themselves with the latest developments in machine design and the new servicing techniques to be adopted in their operation.

For convenience in loading and unloading the larger pieces of equipment, modifications were made to the back of the bus giving direct access through and below the safety door. In this way equipment may be installed and taken out with a minimum of trouble.

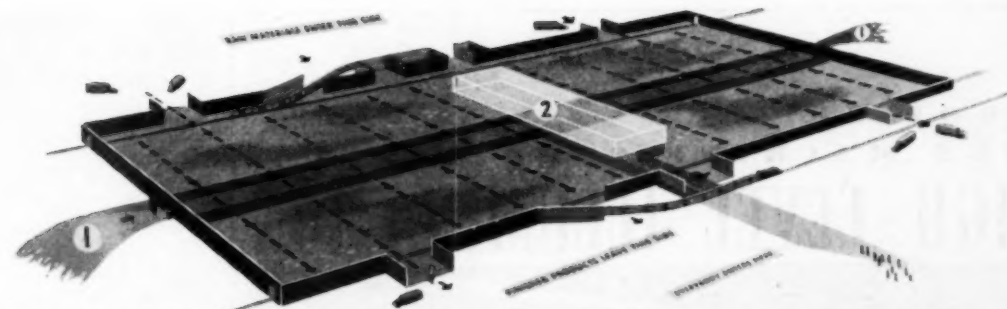
The Healing Display-Mobile is wired for 240 volts and can be plugged in as a working unit wherever switchboards are of sufficient capacity to accept the load.

In designing the unit, due consideration was also given to the comfort and convenience of the crew of two who man the Display-Mobile. Ample cabin room has been provided (Turn to page 67.)



Close-up of portion of equipment showing the "Milesmor" Laboratory Engine Tuner, "Servian" Bench Drill, "Servex" Air Compressor and "Rich" Cylinder hone.





This aerial preview of The Lincoln Electric Company's new 20-acre plant, designed and now being built in Euclid, Ohio, shows a scale model in the actual plant setting. Lighting and ventilation will be under complete control inside the structure, which is bisected by a two-storey office building entirely surrounded by the plant. A 20-ft. service corridor, extending 1,457 feet underneath the centre of the plant from one end to the other, will remove all non-manufacturing traffic from the production floor. Everyone will enter the plant and offices through a ground-level entry building adjacent to the parking area, and will pass under the railroad siding and truck docks to the service floor, where office lobby and plant entrance, personnel offices, dispensary, cafeteria and welding school will be located. In the illustration (1) shows the service access through this artery, and (2) all executive, sales and factory offices centralize here.

## Building the Factory Around the Process

### Design Highlights of Lincoln Electric's New Plant

Arc welding has become a universal putting-on tool. It is the standard joining process in all metal-working industries for both maintenance and production fabrication. It is used for maintenance in service businesses and has become a tool for use on the farm and in the home hobby workshop. Arc welding has assumed a major role in our economy, and it has become a problem of immediate concern to the welding industry to see that more and more of better welding equipment at lower selling prices is provided.

Against this background, top management . . . as well as the entire working force . . . of The Lincoln Electric Company, has been occupied with the planning of the new plant in U.S.A. since the end of the war. The present U.S.A. plant facilities have been rearranged several times in this period in order to determine the most efficient methods for manufacturing welding equipment. These layout changes have drawn everybody into the problems involved, and the results achieved incorporate the best ideas of the entire working force. The layout changes have all served to provide a proposed mock-up for the new plant layout, which is now being given a "trial run" in actual production.

**T**OP MANAGEMENT at Lincoln has been working with a leading firm of building engineers since 1946. Prior to June, 1948, when Lincoln awarded this Company a contract for the design of a new plant, the discussions were entirely exploratory and informal and were carried on with a view to establishing some basic principles, which are reflected in the design finally adopted for the plant. Trade show trips, plant visitations, conferences with business executives were all undertaken by executives of the two organisations, we are told by the management of the company's Australian branch, Lincoln Electric Co. (Aust.) Pty. Ltd., of Alexandria, N.S.W., with the purpose of seeing the most progressive methods of manufacturing in actual operation.

Lincoln and this building organisation had as their common objective in this study the development of a plant which not only would be capable of making better products at minimum costs, but also would be readily adaptable to the changes which are inevitable in any progressive manufacturing operation. The resulting concept is intended to

virtually eliminate most of the paper work and record keeping usually required in connection with manufacturing operations. The methods to be followed in storing inventories of raw materials and materials in process, as well as finished goods, will enable Lincoln to reduce manufacturing overhead by substituting visual controls.

#### LAYOUT ELIMINATES MULTIPLE HANDLING.

The basic floor plan and functional layout is expected to reduce the cost of materials handling to a minimum. This objective will be approached: (1) by eliminating most of the necessity for handling by always moving all incoming raw materials and work in process directly to the point of next use, and (2) by the use of a highly flexible interconnecting plant-wide monorail system for overhead handling, plus lift trucks, roller and belt conveyors and other equipment which will simplify materials handling at the various stages.

To aid plant layout and production engineers in developing methods of storing and selecting the actual types of equipment

best suited for each materials handling function, the contractor's research department developed an all-inclusive check chart. This charts all of the alternatives available for meeting each specific storage and handling problem, and has been a basis for the development of comparative cost data which has influenced the design of the plant, as well as the plan for its operation.

#### THE PLAN.

The plant itself is essentially a one-storey structure . . . 1,400 feet long and 500 feet wide—with a centrally located 60-ft. wide service floor extending the full length of the building (east to west) below ground level. Everyone—production workers, office personnel, executives and visitors—will use a common entrance, passing from a simple modern entry building down a double stairway to the service level, where the plant entrance, a two-storey office lobby, large cafeteria and kitchen, conference and demonstration rooms, and the Lincoln welding school will be located in an area 120 x 200 feet. All of the employee facilities

will be located along a 20-ft. corridor on the service floor, with locker rooms and sanitary facilities at convenient intervals. Provision is being made for the



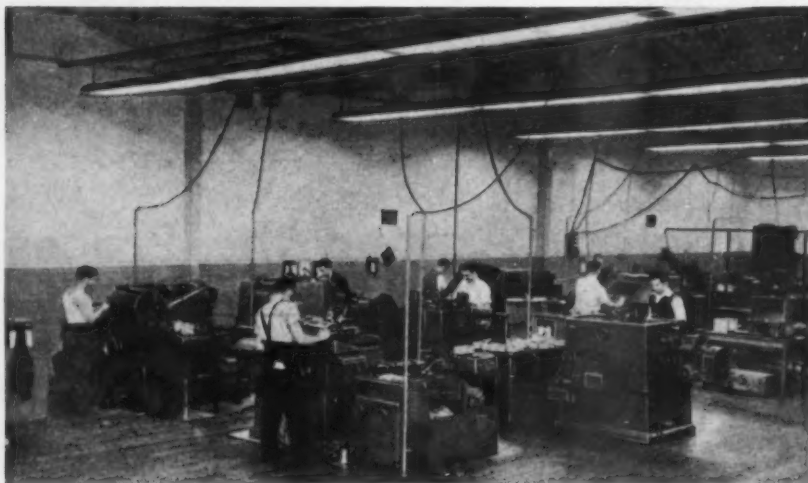
Mr. James F. Lincoln, President of The Lincoln Electric Co., of Cleveland, U.S.A., who is at present visiting Australia.



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installation of 20 stairways leading from the corridor to the middle of the production floor at as many different points along its quarter-mile length, so that everyone will reach the plant floor within 200 feet of his work location. Transformers and other building service equipment will also be located in areas along the service corridor and will facilitate distribution of power, air, water and other service lines throughout the plant.

Production of welding generators and other welding equipment will be segregated in one-half of the building, with manufacture of electrodes at the other end. Offices will be located in a separate two-level "building" . . . 120 x 360 feet . . . in the centre, between the two manufacturing departments, and completely surrounded by the plant. This arrangement will put production executives right alongside the manufacturing areas for which they are responsible, and the shipping department between the production offices and the shipping dock. At the same time, production offices will be directly adjacent to the company's executive, sales and general offices and the research laboratory.

Plant maintenance departments will also be centrally located between the two manufacturing units, in an area between the laboratory and a 60 x 180-ft. boiler house, which adjoins the plant proper on the north.

#### THE FLOW.

All production and assembly operations will be accommodated in lines extending through the building (from north to south), between a continuous enclosed railroad siding and receiving dock along the north wall to the shipping aisle on the south, where separate sidings and truck docks serve the two divisions. This will facilitate the grouping of all equipment required for each integrated department in a straight line and will assist the functional flow of work in process.

Perhaps the most unusual aspect of the new plant will be the disposition of space in the manufacturing areas. In applying the principles of material storing at point of use, Lincoln and the builders have worked out a layout in which the clear span areas between the columns in the 60-ft. aisles will be used primarily for storage and auxiliary operations, from which raw and processed material, parts and sub-assemblies will flow to production and assembly lines adjacent to the column. This will have the effect of absorbing the limited number of building columns in the production lines and will utilise the column supports as raceways in which most of the required services will be carried direct to production lines, where the heaviest concentrations of service facilities will be required.

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(Turn to page 32.)

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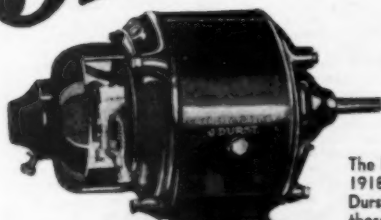
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Douglas & Fraser.

(Continued from page 30.)

requirements dictated by this dis-  
tribution of people and produc-  
tion activity.

The actual character of ma-  
terials handling equipment to be  
used in each individual depart-  
ment is being determined by the  
character and volume of the  
work, while interdepartmental  
movement will be handled largely  
by the interconnecting network  
of overhead monorail bridge  
cranes. Special transfer switches  
will be installed along the trans-  
fer aisles extending the full  
length of the plant on the north  
and south, adjacent to the receiv-  
ing and shipping docks, so that  
it will be possible to move a  
load between any two desired  
points in the entire plant with  
a single lift.

### THE STRUCTURE.

The building has a framework  
of shop and field welded struc-  
tural steel and a flat roof.  
Standard H-section trusses with a  
60-ft. span have been used with  
40-ft. jack trusses to eliminate  
the alternate columns. In a space  
120 feet square, for instance,  
there will be only two interior  
columns.

Clearance of 23 feet below the  
trusses is being provided in the  
production area, with 25 feet in  
the north and south bays, where  
railroad sidings and truck docks  
for receiving and shipping will be  
served by transfer cranes.

Aluminium facing sheets, spe-  
cially rolled to form 31 in. deep  
box sections, 15 inches wide, are  
being used for the exterior fac-  
ing. These units extend 25 feet  
from the brick and limestone sill  
wall to the roof line. The wall  
is being finished off with black  
aluminium coping. The inner  
wall consists of 11 in. steel panels  
of comparable height, which are  
being installed with 1 in. insula-  
tion and a vapour seal.

The 25-ft. long wall segments  
are secured to the frame entirely  
by arc welding and stud welded  
fasteners. Three-eighths inch  
threaded Nelson studs first in-  
stalled along girts at three levels,  
one at the sill line and two  
above the bottom chord of the  
trusses. The panels, which form  
the finished interior wall, are  
pre-punched at three points to fit  
over these studs and are fastened  
by arc welding to the girts.

An additional girt which car-  
ries a fourth row of Nelson studs  
is then arc welded to the outside  
of the wall, midway between the  
sill line and the trusses, to pro-  
vide an additional means of  
securing the long aluminium fac-  
ing panels to the inner wall. Alu-  
minium transition nuts, especially  
coated to eliminate the possi-  
bility of galvanic action between  
the steel and aluminium com-  
ponents, are then installed. The  
insulation is applied next and is  
held in place by 10-gauge head-  
less welding pins, which are stud  
welded to the Ferrobond and  
capped with speed clips.

After application of the insula-  
tion and vapour seal, the light-  
weight deep-drawn aluminium  
panels, which are pre-punched at  
four points on either side, are

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placed over the protruding studs, where the transition nuts already in place insure proper alignment. Because aluminium expands at a rate twice as much as steel, it is necessary to provide for an extra 3/16 in. expansion within the 20-ft. distance between the main girts. The aluminium siding, therefore, is firmly attached to the steel panels at the mid-point. This steel connection at mid-point will move with the steel frame itself. The aluminium siding will move with it, and the excess movement in the aluminium is allowed to slide on aluminium shoulders formed on the aluminium transition nuts.

The fastening is then completed by installation of aluminium acorn nuts, which are screwed tight to complete the bond between the transition nut and the facing panel.

The small size of the nuts and their location in the deep valleys which introduce the vertical element that gives texture to the long sidewalls means that the fasteners are practically invisible.

The roof is being enclosed with a 1 1/2 in. welded steel deck, with 1 in. insulation covered by built-up tar-and-gravel waterproofing.

The lighting equipment and ventilating controls have been designed to maintain efficient working conditions in all parts of the plant. Dust and vapours created by metalworking and processing activities will be removed at their source and exhausted through the roof, while a continuous supply of air will be delivered to the various working areas at the proper temperature by ventilating units which will be mounted on platforms in the roof trusses.

The Lincoln Electric Co. (Aust.) Pty. Ltd. has supplied "The Australasian Manufacturer" with the following statistical details of the new building:—

Approximate cost, £8,500,000.  
Area of site, 65 acres.  
Floor space, 850,000 sq. ft.  
Structural steel, 5,600 tons.  
Reinforcing steel, 900 tons.  
Fencing, 6,000 lin. ft.  
Railroad sidings, 9,200 lin. ft.  
Earth moving, 100,000 cu. yards.  
Concrete, 25,000 cu. yards.  
Brick, 1,200,000.  
Aluminium and steel insulated sidewall, 94,000 sq. ft.  
Paving (black top), (incl. parking for 1,000 cars), 46,000 sq. yards.  
Fluorescent lighting, 16,000 lin. ft.  
Coal storage capacity, 450 tons.

**After Business Hours**  
(Continued from page 3.)

that end, and is a chicken in potentia."



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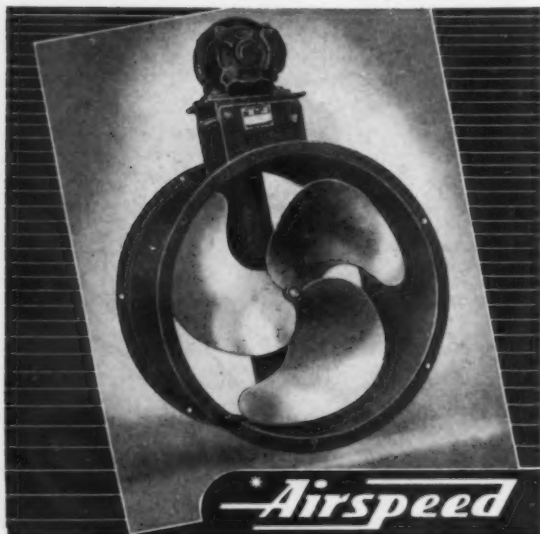
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Subtle replies: "The same we say of lead and other metals which would be gold if they had but time . . . for I were absurd to think that nature in the earth bred gold perfect in an instant. Something went before."

When alchemy gradually died out and the science of chemistry was founded on accurate observation, the mythical "Philosopher's Stone" lost its popularity.

It died a hard death, and even to-day the ghost of the idea still makes an occasional appearance. The world, however, owes a great debt to the old laboratory alchemists, who, although they failed to transmute the common metals into gold, nevertheless in their search made many other discoveries which have since been of great benefit to all of us. These discoveries to some extent were responsible for silencing the scholastic jargon and nonsense poured forth by the armchair Alchemist-Philosophers.

The changing of one kind of metal into another has nothing to do with the prolonging of life. The tragedy is that the modern secret formula culminated in the greatest life-shortening weapon the world has known. When it was realised that the atom, in spite of its Greek derivation "indivisible," was not the ultimate particle, the search for a means of dividing its nucleus brought back to life the old dream of "The Philosopher's Stone." Well before the great explosion of Hiroshima, aluminium had been changed into phosphorus, magnesium into sodium, and platinum into gold, to name a few of the modern transmutations. But it took the search for a life shortener to bring the making of gold on to any sort of practical scale.

You remember the old legend of King Midas, who, when he was asked by the grateful god Bacchus to name his own reward, very foolishly desired that everything he touched should turn into gold. At first he was very happy with the gift from the god, the chairs and tables turned into solid gold, but when he saw his food and drink turning into what Shakespeare calls "gaudy gold, hard food for Midas," in his hunger and thirst, he cried to Bacchus to take back his uncomfortable gift.

"The Chinese gold hoarders are in a panic," said the newspaper report, "the news had reached them that the atomic energy plants were turning common metals into gold."

Has the modern "Philosopher's Stone" turned out to be the "Elixir of death?" Gloomy thought.

### BURLINGTON MILLS' S.A. AGENT.

Mr. F. S. W. Oldham, well-known manufacturer's agent, of Adelaide, has changed his address from Edmonds Building to 155A Rundle Street. Mr. Oldham, who is in charge of Goldberg Agencies (footwear), is also the Adelaide agent for the Bradford Cotton Mills Ltd. Recently he was appointed agent for Burlington Mills (Aust.) Ltd., of Sydney (rayon).

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## New Ideas in Plastic Mouldings

Featuring items of special interest to Australian manufacturers and users of Plastic Compounds.—Published with the object of further developing this important industry in Australia.

### Extruder Pump Pre-plasticizer New Development in Field of Injection Moulding

One of the latest developments in the field of injection moulding is a recently announced machine which is essentially a combination of an extruder pump and a clamping press. The unit is novel in that its principle of operation is different, yet it is practical because of its simplicity. Simply stated, the machine makes use of an extruder pump for heating the moulding material and forcing it into an injection chamber, plus a vertical two-ram transfer-type hydraulic press for clamping the mould and injecting the pre-plasticized material through a sprue and runners into the mould cavities.

The first press was completed some months ago, and has been operated on numerous test and continuous production runs in the company laboratory. Several additional machines were subsequently installed in moulding plants throughout the country.

THE machine described in this article has a rated capacity of 48-oz. and requires only 81 sq. ft. of floor space. It is equipped with a 3½-in. extruder pump of special design. Powered with a 30 h.p. motor, the extruder worm can be brought up to speed in less than one second. This acceleration is possible because the motor runs continuously and is engaged and disengaged by a patented clutch. The extruder pump is mounted on the side of the vertical press in such a manner that the thermoplastic material is fed from the extruder through its die directly into a special type vertical injection chamber. This injection chamber is mounted on a fixed bolster plate which is located somewhat below the head of the transfer-type press. An auxiliary downward-acting hydraulic cylinder is mounted on the head of the press. This assembly is very similar to the auxiliary ram of a transfer press. The ram of this

overhead cylinder, however, is so arranged that it will travel nearly to the bottom of the injection chamber, but when it is raised or retracted it will not be completely withdrawn. An opening or port machined in the side of the injection cylinder accommodates the die of the extruder. Thus, with the overhead ram in its raised position, the port is open, permitting the extruder pump to force plasticized material into the chamber.

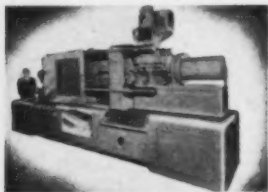
The amount of material thus forced into the injection chamber can be controlled, says "Modern Plastics", by two methods. By means of a time control on the extruder, it may be operated for a

pre-determined number of seconds; by means of a torque control on the extruder worm, the extruder will be automatically stopped when the back pressure of the material creates a pre-determined torque. The worm control mechanism, consisting of the timer and clutch, is reported to operate so uniformly from cycle to cycle that the amount of material delivered to the injection chamber does not vary more than 1 of 1 per cent. The adjustable torque control operates Micro-switches which disengage the clutch to the driving motor. A similar set of controls serves to start the extruder after the cham-

ber has been emptied and the overhead ram piston raised, opening the port into the chamber.

The extruder pump is designed with three heat zones, each separately controlled by indicating pyrometer units. Since the material capacity of the third, or high heat zone, of the extruder is equal to the top capacity of the injection cylinder, only uniformly and completely plasticized material will be forced into the injection cylinder during each cycle. Thus the injection piston operates only against completely plasticized material and the injection pressures required are markedly lower than those normally encountered in standard injection moulding.

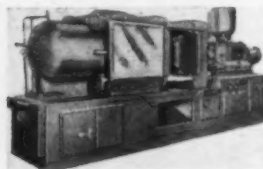
Another feature of the machine which makes it unnecessary to use high injection pressures is the complete absence of any spreader, or torpedo, in the injection cylinder. With only relatively low injection pressures, it follows that clamping pressure requirements are comparably low. These low-pressure features make possible the use of relatively



In this injection machine, which uses a plunger pump pre-plasticizer, positive clamping is achieved by rotating a thrust plate.



Schematic layout, partially sectioned, of the main parts of the injection machine, with extruder pump pre-plasticizer, described in the accompanying article.



This 48-oz. injection machine has automatic stuffing.

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light construction for the vertical transfer-type press. Furthermore, it is not necessary to use large pumping equipment. It also follows that operating costs are relatively low.

The Australian agent for the makers, Swift & Co. Ltd., of 26 - 30 Clarence Street, Sydney, informs us that this machine is available with injection capacity of 60 oz., and will shortly be available in capacities of 80 oz. and 160 oz., with all of the advantages found in the 48-oz. model carried over into these three larger sizes.

### PLUNGER PUMP PRE-PLASTICIZER.

Another new line of injection machines which departs from the "standard design" also features means for pre-plasticizing. The material is fed through a pre-plasticizing chamber by a reciprocating plunger, and it is claimed that as the material leaves this chamber it is fully plasticized. In operation, as the injection piston is retracted after the injection stroke, it opens a port in the chamber leading to the pre-plasticizing unit. Immediately this port is opened, the plunger of the pre-plasticizer proceeds to force material into the injection chamber until this chamber is full. When the chamber is filled it stops the operation of the plunger in the pre-plasticizer due to the back pressure created.

These new machines have capacities of 32 and 56 oz. and

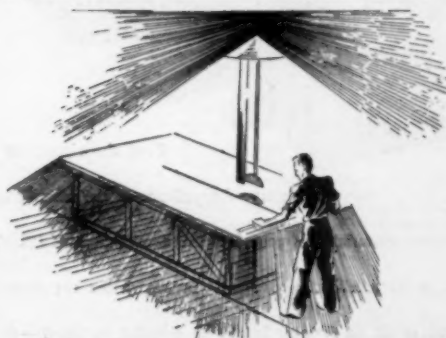
clamping pressures up to 750 tons. A small, long-stroke cylinder closes the moulds, and the clamping pressure is obtained by rotating a thrust plate which transfers the thrust of the clamping force to the rigid frame. This permits the use of a large clamping cylinder having a very short travel for final clamping under high pressure. With the mould clamped, the injection piston operates on material which is in a semi-fluid condition. Because of this, friction is reduced to a minimum and injection as well as clamping pressures are low.

### LARGER CAPACITY INJECTION MACHINES.

We also illustrate on page 36 another single-shot automatic 48-oz. machine which is provided with an automatic stuffing arrangement said to increase the rated capacity by 40 to 50 per cent. This stuffing arrangement allows for more than one stroke of the injection piston during each cycle and its automatic control ensures that the injection piston will stuff accurately at a pre-determined point on the second stroke.

The heating cylinder of this unit is designed to deliver near-capacity shots of such "de-rating" materials as polystyrene. The electrically controlled material feed is self-compensating. Both injection plunger and clamp ram have speed and pressure adjustments. Automatic slow-down and slow-break at mould-

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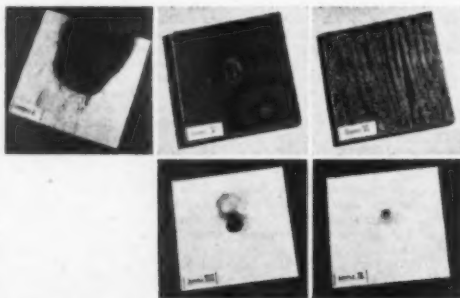
opening permit high speed approach and return travel of the clamp ram without danger of mould damage. The stainless steel hopper receives a barrel of plastic, and the plasticization capacity of the machine is approximately 200 lb. per hour. The unit is equipped with a 1,000-ton clamp; daylight opening is adjustable to 54 in. maximum. With a die area 30 by 50 in., this machine is operated by a 60-h.p. motor.

sirable mechanical features, but also stands up under severe flammability tests.

The new material may have a core of either pure aluminium or aluminium alloy. Although it is possible to employ any core thickness, production economies dictate concentration on two standard thicknesses: a E.A. 60 half hard 14-gauge core (0.08 in.), and a 20-gauge (0.036 in.) pure aluminium core. When based on the 20-gauge core, the laminate has a facing on each side of 0.02 in. phenolic sheet. The decorative surface may be had in black or any standard dark colour, and in wood grain or pattern design. The core permits the sheet to be easily formed or bent, even to small radii.

### NEW LAMINATE IS NON-FLAMMABLE.

New vistas on the decorative laminate front—with both domestic and commercial possibilities—have



Identical flammability tests were applied to these five samples. Sample VI, a phenolic laminate on aluminium core, reveals no damage. Sample I is plywood, while V and VIII are asbestos-filled materials. Negligible damage was done to sample IX, a decorative urea sheet over an aluminium core.

been opened by the development of a plastic surfaced sheet having an aluminium core. The new material—not to be confused with heat resistant laminates embodying aluminium foil immediately under the surface sheet—not only has de-

Technicians report that such formed shapes are less prone to return to the original flat sheet than are ordinary paper laminates.

Whereas other plastics laminates used for decorative purposes cannot withstand severe flammability

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tests, phenolic and urea faced metal core laminates have qualified for the non-inflammable classification, thus substantially enhancing their prestige for decorative use in ships, trains, and planes. In comparative tests, the light alloy cored sheet was found to withstand flame better than sheets bonded with phenolic resin and filled with glass or asbestos fabric.

The new material possesses two additional advantages: stability and decorative flexibility. While conventional laminates tend to buckle between fixed points under varying atmospheric conditions, the metal cored material did not bend even after undergoing an extended water immersion test. Another asset is that the metal core, when exposed by machining away the plastic facing, presents diversified decorative potentials without requiring a second material.

### A POLYTHENE FEMUR.

Although it is usual to associate polythene with electrical, chemical and packaging applications, the chemical inertness, purity and

other properties of this material make it specially suitable for medical purposes, and already it has been used in the human body, in the form of a bag, after certain chest operations.

The potential of this material in the surgical field is indicated by a



Artificial bone made of  
Alkathene.

recent outstanding surgical experiment at the Royal National Orthopaedic Hospital, England, using the artificial bone made of Alkathene illustrated below.

As a result of a disease of the bone it was necessary to amputate the patient's leg, and if this opera-

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paste resin 121	Polyvinyl chloride resin in special physical form. Gives free-flowing pastes on simple mixing with plasticizer. For fabric coating, films, dipping, moulding, casting.
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<b>LUSTREX LX</b>	Heat-resistant polystyrene, formerly Lustrex.

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<b>LUSTREX L-PIX</b>	Improved mouldability over L-PI; available in crystal only.
<b>LUSTREX L-PIA</b>	Improved mouldability in transparent colours.
<b>LUSTREX L-PIB</b>	Translucent and opaque colours with exceptionally good mouldability.
<b>LUSTREX LX-PIL</b>	All the excellent properties of L-PIL plus highest heat-resistance of any commercially available polystyrene.

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tion had been carried out in the usual way, an artificial leg would have been required with which the patient could not have walked satisfactorily.

Part of the femur was therefore prepared in Alkathene and inserted into the hip joint in such a way that muscles passed through slots cut in the femur. The amputation stump healed satisfactorily and the patient now is able to walk by means of a normal artificial limb.

It is believed that this operation has never been carried out successfully before and certainly it is the first occasion on which a plastics material has been employed in this way.

for brazing with adhesives and to provide a shielding atmosphere.

Electrical power is regulated by a control panel on which is mounted an electric powerstat rated at 7½ amps, 115 volts, 60 cycles a.c. Also on the panel is a pressure reducing valve for adjustment of air



## **PLASTIC WELDER-SEALER.**

A wide variety of welding and sealing operations on plastics may be performed on a new flameless, electrically heated torch recently introduced. Designed as a compact, efficient, easily handled unit, the heater can be adapted to heating, melting, sealing, or welding such plastics as polyethylene, nylon, and polyvinyl chloride.

Essentially, the torch is a source of high temperature gaseous heat without flame, delivering air or gas at any controlled temperature up to 700°F. and at pressures from 5 to 40 p.s.i. Built for continuous operation, the torch can be fitted into machinery requiring spot heat sources, and may also be applied

Flameless, electrically heated torch for sealing operations on plastics.

or gas pressure. Both torch and panel are carried in a strong, steel carrying case equipped with holders for the power and air controls, weighing a total of 30 lb.

## **THEY'RE SAFE INSIDE.**

A new process moulds clear acrylic plastics around delicate parts and materials. The photo on page 41 shows samples (nylon mesh, left, sea fauna, right). Electrical and watch parts can be embedded to make training, de-

monstration units. The process is not limited to display and premium items. For instance, mirrors may be made by moulding aluminium foil inside; electronic parts, insulated and protected. The process is a compression-moulding rather than a casting technique. Dry moulding powder is used.



Moulds plastics around delicate parts.

To meet needs of weather resistance, low tooling cost, light weight, ability to resist damage, a designer chose resin-impregnated glass fibre mat for this part. It's a housing for a new motor scythe. With plastic tools to produce part it's easy to change design, cuts fabricating costs. It's proof that, where design is right, plastics hold their own against metal.

#### SOME LESSER KNOWN USES OF PLASTICS.

How often one hears the phrase, "it is made of plastics". How many of the millions of people who saw it said just that of the snow in the film "Scott of the Antarctic"? The artificial snow in that film was an expanded plastics material. It had the consistency of frozen snow; it was white; it looked like snow; it was conveniently photogenic and it faithfully left the print of labouring feet.

From that small insignificant application it is but a short step to a world-wide use of the same material in the manufacture of plywood. The material, a urea/formaldehyde resin, is used in some thousands of tons annually for sticking veneers together to produce multi-ply woods.

Synthetic resin adhesives, and there are many types, were introduced about 1930, and because of their superior qualities, mainly water resistance, they have been steadily replacing glues of animal and vegetable origin ever since.

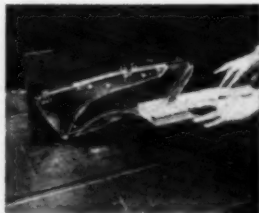
Writing in "British Plastics", H. H. Woolveridge, B.Sc., points out that in the shipbuilding industry, for instance, the builders of Sir Malcolm Campbell's record-making "Bluebird" have built arma-

ment-carrying high-speed craft in a completely unorthodox manner to gain full advantages of the properties of one particular type of synthetic resin glue.

In such craft a cold-setting adhesive provided the only means of fastening anywhere, except for nails for tacking purposes where it was found impossible to shore

or cramp components while the adhesive set. The result was a 40 ft. boat of immense strength and showing a big saving not only in weight but in time and labour spent on its construction.

Barrels for the brewing and chemical industries are now being made from laminated wood. The staves are interchangeable and in place of 20/25 staves in the solid wood type, this new type of barrel has 8/10. Combined with the greater dimensional stability of the laminated staves, this makes for less



Transparent guards for circular saws of 8 to 20-in. diameter are now being manufactured as standard units. The transparent acrylic guards offer as much protective value as metal guards, but do not interfere with visibility. The guard is made in two styles, one for stock up to 3-in. thick, and a double-pivoted type for thicker stock.

leakage and therefore less cooping. During the war an outstanding application of resin adhesives was that they made possible the Mosquito aircraft.

Hardly different from resins used as adhesives are those used for impregnation of wood, paper and

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fabric. At random, a few end products are table-tops, wooden propellers for aeroplanes, decorative panelling, skis, electrical bushings and instrument panels. Resin plus fabric gives materials from which are cut silent gear wheels, or parts of textile machinery needing only water as a lubricant. These are just a few unobtrusive ways in which resins play a part in our everyday life.

In conjunction with a natural product, synthetic resins give composite materials having qualities superior to those of the natural product alone. High mechanical strength, excellent water resistance, high electrical insulating qualities, can, if desired, be combined in a single material.

A good example of the improvement of a natural product by the use of a resin is in the manufacture of creaseless fabrics—fabrics in which a urea-formaldehyde resin is formed in situ.

At this point it is relevant to mention the development of plastics spinning bobbins. Owing to a restricted supply of the right kind of wood for this purpose, bobbins made of plastics materials have been tried and found satisfactory. The textile industry is as conservative as any, but it is now seeing the advantages of this new bobbin.

After wood and textiles, how about steel? In the grinding or high-speed fettling of steel sheets and castings, a ceramic wheel was at one time used, but during the last 10-15 years there has been an almost complete changeover to a resinoid wheel with very high peripheral speeds, in which the finely divided abrasive is held together by a synthetic resin. For cutting steel rods, thin parting-off wheels are used and, although delicate-looking, they are extraordinarily tough and serviceable.

Plastics have invaded even the iron foundry. For years linseed oil has been used as the binder for foundry sand, and particularly in the production of cores. First used in the casting of aluminium and magnesium, it was not long before the use of synthetic resins was extended to iron foundries. Economy in time of preparation and in burning out has an important bearing on the cost of complicated castings. This economy is matched only by the necessity of using as core binders indigenous materials, into which category so many plastics materials fall.

In the gramophone record field, experimental work has been going on for a long time to produce a disc with micro grooving. In spite of the catch question, "How many grooves are there on a gramophone record?" To which the correct answer is, "One", the new plastics record has 200 grooves to the inch.

This enables a whole symphony to be recorded on one side and, more important, it enables an 800-page book to be recorded on twelve or 14 discs for the use of the blind. The plastics record gives good reproduction with improved depth of tone and absence of surface noise.

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Here is a case where the synthetic replaces the natural plastics—shellac—and it is a development which may be far-reaching in its effect. The material, polyvinyl-chloride, is the same or substantially the same as that used for making light-weight raincoats, baby pants, cable insulation, tablecloths and curtains. Incidentally

find a big market in America, where a very high percentage of all new cars are fitted with cashew brake linings. They were used during the war in the brakes of heavy aircraft and fast-landing fighter aircraft, because, by reason of their high heat-resistance the braking effect was sustained with practically no fading.

This resin is also used as a stopper for oil-filled cables, as a splicing compound and for filling terminal boxes and magneto housings. Cashew resins have an extraordinarily good resistance to acids and alkalis and therefore find application in the protection of chemical plant.

Strangely enough these resins are used in insecticides. The resins are mutual solvents for rotenone, the active principle of derris root, and petroleum. These petroleum derris insecticides have proved specially valuable in citrus-growing areas. Cashew nut shell liquid qualifies for special mention because it probably represents the only economic source of a naturally occurring phenol.

Switching abruptly from the industrial world—our personal uses of plastics are legion; they are almost too well known to mention here—toothbrushes, safety razor boxes, combs, wristwatch straps, plastics-covered steering wheels, spectacle frames and so on.

Not so well known perhaps are acrylic contact lenses for the human eye and "piped light" for the use of the doctor in inspecting throats and noses.

Even less well known is the use of a plastics material to supplement the generosity of the blood donors. This material has the name polyvinyl pyrrolidone. It is a hygroscopic, water-soluble polymer which remains soluble in dilute salt solutions. Its plasmolytic properties, when used in saline solutions, are similar to those of blood serum. It is tolerated by human beings independent of the blood groups and up to 50 per cent. of the blood can be replaced by a 2/3 per cent. polymer solution in saline. As such solutions are easily sterilised and stable, their use in



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It is that same product which goes into the making of slipper soles and dolls' heads—such is the versatility of this particular material.

For many years the cashew nut, a native of Brazil, has been roasted in order to char the hard shell and thus win from it its edible kernel, which is consumed in large quantities in America. As protection for the kernel, that is the seed, nature has provided a shell permeated with a liquid sufficiently poisonous to repel invading insects.

In the early 20's, this protective liquid was studied and found to be capable of forming resinous substances. Actually it is a meta-substituted phenol having a side chain of fifteen carbon atoms. As friction dusts in brake linings and in clutch facings, these cashew resins



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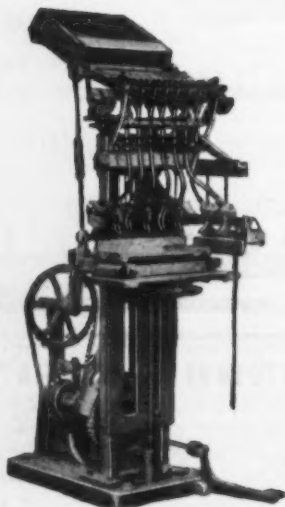


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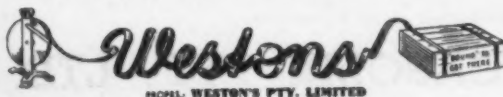
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emergencies is preferred to blood plasma. During the war the German Army was said to have used this product extensively in the field (German trade name "Periston"). The production is derived from acetylene via 1,4 butanediol—butyro lactone—pyrrolidone—vinyl pyrrolidone.

From remote antiquity, seals have been used to denote the authenticity of the documents to which they were attached. Wax, lead, gold and silver have all been used, and probably pure beeswax held pride of place until about the middle of the 16th century. Sealing wax or Spanish wax took its place and was still used for the Great Seal up to 1934. When a sealing-wax seal had occasion to pass through the tropics it exhibited its thermoplastic nature with somewhat disastrous results on the identity of the seal.

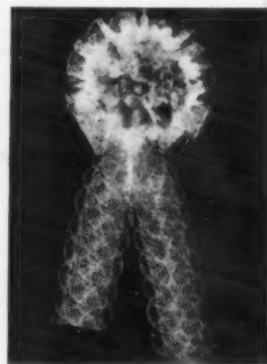
In 1932 the Royal Mint asked the help of a manufacturer of plastics. After some experimentation, a special cellulose acetate moulding powder was adopted, and, in 1933, the report of the Deputy Master of the Mint set on record officially the successful outcome of these experiments.

After Royal Approval had been obtained for the use of the new material, it was employed formally for the first time on November 8th, 1934, to seal the patent conferring a baronetcy on Sir Charles H. Collet, who was then about to finish his term of office as Lord Mayor of London. Since October, 1934, this particular moulding powder has been used exclusively for the Great Seal of the Realm and for the Great Seal of the Union of South Africa.

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(Turn to page 46.)

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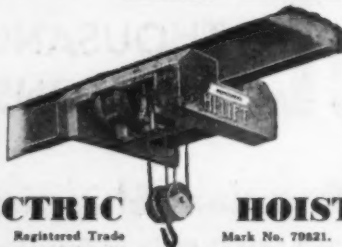


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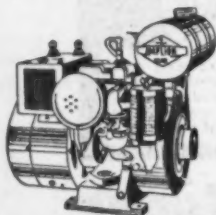
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(Continued from page 44.)

plastics. It may be roll cast in place with a transparent adhesive when combining it with paper, cloth, and other acetates.

Considerable emphasis has been placed upon the use of the material in making ladies' hats. A noted New York milliner recently conducted a style show devoted exclusively to creations of this material. Factors influencing its adaptation to hats include: it will not wilt in water, and thus can be washed or worn in the rain; it will not fade in the sun; it is lightweight; it is flame-resistant; and it will not run or unravel. In addition, it may be sewn by hand or machine, and is available in a wide variety of colours.

The acetate lace is distributed in two forms: as ribbons in 3 in. and 5 in. widths with scalloped edges; and as sheets 36 in. wide, without scalloped edges. Its use in packaging has been directed principally at gift wrapping. In that capacity, it is offered to department and gift stores and variety outlets with gift-wrapping departments. To facilitate its resale by retail stores in yard-goods form, the product is furnished in 50 yd. rolls.

Since the cobweb-like material will withstand refrigerator storage, it has found favourable reception by florists who use it to make corsages in advance of sale.

### CHICAGO INTERNATIONAL TRADE FAIR.

The American Consul General in Sydney has been informed that the closing date of the First United States International Trade Fair to be held in Chicago next August has been extended to August 20 at the request of exhibitors. The Fair will open August 7.

Colonel John Newton Gage, formerly in command of United States Army Quartermaster Depot in Chicago, has recently been named Managing Director of the Fair. He assumed full time duties on April 1, 1950.

A new corporation took over operation of the Chicago Trade Fair on January 20. The United States Department of Commerce

reports that the officers of the corporation known to it are as follows: I. E. Anoff, President of Albert Pick & Co., President; Robert P. Williford, Executive Vice-President of the Hilton Hotels, and Otto K. Eitel, President of the Bismarck Hotel, Vice-Presidents; Merton E. Thayer, Assistant General Manager of the Union Stock Yards and Transit Company, Secretary; William J. Wilson, Secretary of the Greater Chicago Hotels Association, Assistant Secretary.

### FURTHERING DECENTRALISATION OF INDUSTRIES.

The Rural Finance Corporation which was established recently in Victoria, is expected to assist materially in the establishment of additional industries in country centres. The Premier, Mr. Hollway, expressed this opinion at the Corporation's first meeting which was held at his office, when matters of policy were considered.

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## Metallizing Speeds Repairs

### Sprayed Metal Surfaces on Textile Machine Parts

Two recent developments have made metallizing more useful to textile mills than ever before for rebuilding worn roll necks, journals, spindles, whorls, armature shafts, and the like. One development is a new method of preparation, which has cut the overall time for metallizing work by about 50 per cent. This method eliminates several steps in the preparation of surfaces, makes thinner coatings practical, and reduces the amount of finishing.

The other development is the use of gas-flow meter units with metallizing guns. These units enable even a green operator to get exact flame balance for spraying any metal, and to do it consistently time after time. This flame balance means consistent results and, incidentally, higher spraying speeds as well.

**A**N alloy high in molybdenum can be sprayed with an ordinary metallizing gun and will bond itself to smooth and highly polished surfaces. The only requirement is that the surfaces must be absolutely clean. This cleaning can be done in several different ways by removing a little surface material. Dry machining, writes John E. Wakefield in "Textile World," is probably the quickest and simplest method for most surfaces, such as shafts and journals. A light, fast roughing cut is enough; or, in some cases, the use of clean emery cloth is satisfactory. The main object is to get below the skin and expose clean new metal.

Once the machining is done, 0.0015 to 0.002 in. of the molybdenum alloy is sprayed on. This depth is enough to make an excellent bond for any other sprayed

metal. The alloy is used only as an undercoat, because it is quite costly. However, in the very thin layer needed for an undercoat, materials cost is low and is more than paid for by the elimination of machining operations.

The alloy bonds very well to all common steels, stainless steels, cast iron, cast steel, monel, nickel, magnesium, and most aluminium alloys. It will not bond well to copper, brass, and bronze. However, any metal, including copper and its alloys, can be applied over the alloy undercoat. Hence, the method is useful for almost any kind of textile machinery.

There is one other limitation. The method should not be used where the surface is interrupted, such as a shaft with a keyway, because sprayed metals shrink some as they cool to room temperature.

The shrinkage causes stresses on the bond. Where there is complete coverage or a complete envelope around the shaft, for example, the stress generally does no harm. However, on an interrupted surface, the stress could pull the coating away from the base, unless a strong binding method such as threading is used.

#### USE ON BEARINGS.

The method is excellent on all kinds of bearing surfaces, journals, necks, and so on. The advantages of time and speed show up in such applications as on the card feed roll. The best previous method of preparing a worn neck was to thread it and use a rotary shaft-preparing tool. This preparation involved several machine operations.

In the old method the worn section was undercut 0.010 in. below the deepest wear. Ends of the section were dovetailed. Then, a square-threading tool was ground 0.045 in. wide and a 16 thread cut to a depth of 0.020 in. This cutting usually meant three to four cuts to reach the desired depth. After threading, the rotary shaft-preparing tool was run over the threads

three or four times lightly to roughen them still further. A typical roll neck formerly took 30 to 40 min. to prepare.

In spraying the surface, several passes of the gun were made by hand at angles of 45 deg. each way to fill the grooves. The coating had to be built up over the threads at least 0.030 in. above desired finished size to allow enough to clean up properly. Threads in the base caused an uneven surface on the coating. In this coating, it was necessary to spray as much metal as had worn off, plus at least 0.050 in., allowing for the amount in the threads and the thickness for finishing.

#### NEW METHOD.

Using the new method, a light, fast roughing cut to clean the surface is the only preliminary machining operation. After the roughing out, the alloy undercoat is sprayed on, and the neck is ready for metallizing with the final coating. Less metal is used, since there are no threads to fill, and 0.015 in. on the radius is enough for finishing. The average time for preparing, spraying, and finishing a card feed-roll neck using the new



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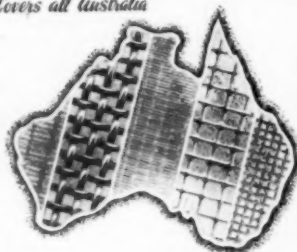
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method is 17 min. Under the old  
method, total time was nearer 50  
mins.

Another good example showing  
the value of the new method is on  
spindles. The worn surface can  
be cleaned up with emery and the  
molybdenum alloy sprayed on.  
Spindles are not further weakened  
by being ground or machined  
deeper, and a good deal of time is  
saved. Average time for doing this  
work, where a fair-sized quantity  
is done at the same time, is about  
3 min. per spindle, including  
preparation and spraying. Thus, the  
salvage of even such small diam-  
eters is a worth-while operation.

One overseas rayon plant has  
over 21,000 spindles, 15 in. long  
and about 1/2 in. diameter at the  
thinnest point. The plant reports  
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worth-while development in elim-  
inating the human element in

metallising. Gas passes from the  
pressure regulator on the cylinder  
into the bottom of one tube, oxygen  
passes into the other. The flow of  
gas and oxygen raises ball floats  
in the tubes. Lines marked on the  
tubes and the charts which come  
with the units show just where  
the floats should be for any metal  
being sprayed. Hence, an opera-  
tor, by manipulating his pressure-  
regulator handles, can adjust the  
flow of gas to produce an exactly  
balanced flame.

Until now, an operator has had  
to depend on the appearance of the  
flame for his adjustment, and the  
human eye cannot tell from the  
colour of the flame when it is ad-  
justed exactly right. The result  
was that the coating would be soft  
and easily machineable one time,  
and so hard that it was difficult to  
machine at all next time. With  
the flow-meter unit, the coatings  
come out the same every time.

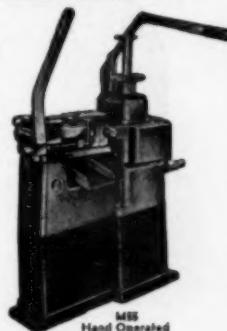
Previously, when adjustment  
was made from the color of the  
flame, metal was sprayed more  
slowly than it could have been.

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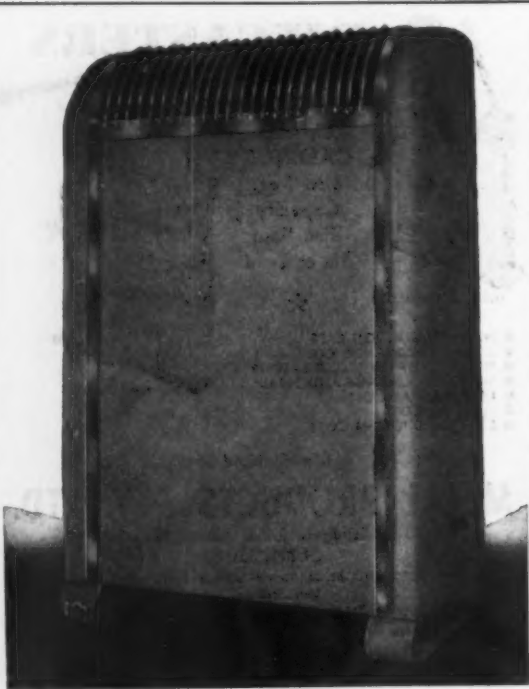
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#### SPRAYED METALS.

Sprayed metals absorb up to 10 per cent. by bulk of lubricant when soaked in it for several hours. Sprayed metals will also run with much less friction than ordinary metals, because of this oil absorption. Furthermore, sprayed metals will run without trouble for a very much longer time when anything happens to the oil supply.

In one series of tests, hardened surfaces were run in white-metal bearings using plain oil. After the oil supply was intentionally cut off, the hardened shafts seized in an average of 21 hours. Sprayed-steel surfaces similarly treated ran an average of 22½ hours with no new oil. Freed, they ran for three or four hours more before seizing again.

Similar tests made with graphited oil showed up the sprayed-metal surfaces to even better advantage. Several Southern cotton mills have already put these findings to use. Lickerin-roll journals, doffer-shaft journals, comb-shaft journals, and many other similar parts, have been metallised with 0.10 or 0.80 carbon steels and then soaked in graphited oil. All of the reports from these mills indicate that the parts have already worn much longer than usual and will continue to operate without trouble almost indefinitely.

There are two reasons for this greatly reduced friction with sprayed metals. One is the actual absorption of oil into the pores. The other is that a finished sprayed-metal surface has a matte finish much like that produced by the wearing-in process on ordinary metals. Furthermore, as the shaft wears, new pores are exposed, as the matte finish extends all the way through the coating. A matte finish is generally considered to be the best surface for holding an oil film.

#### METALLISING APPLICATIONS.

There are a great many practical applications for metallising in textile mills. Among the jobs already done quite successfully are the journals on feed-roll drive shafts, spiked-apron stretcher shafts, comb shafts, fluted calendar rolls, cradle shafts. Parts like these are done usually with 0.10 carbon steel over the self-bonding undercoat. An even better wearing surface can be produced by spraying them with 0.80 carbon steel. This coating does require grinding, but the sprayed surface is hard and wears for a very long time.

Several applications have interesting cost-saving possibilities. For example, a slasher-roll surface can be coated with stainless steel for about one-fifth the cost of a new stainless-steel roll. The entire job was completed in less than five hours. In service, the sprayed stainless steel compared very favourably with ordinary stainless-steel surfaces.

#### NEW ALLOY USED.

It has recently been reported from England that a company there has been rebuilding copper printing rolls successfully with metallising. Such rebuilding has not been practical in the past, due to the porosity of sprayed copper. However, this company built up the roll with a new aluminium-iron bronze instead of copper. The sprayed bronze was ground for finish, etched, and used for printing. The mill reground the roll and re-etched it three or four times, and is thoroughly satisfied with the results.

The advantage of being able to do this job with metallising is obvious. Plating with copper is a slow and expensive operation. Plating generally builds up about 0.001 in. per hour, although it is understood that some modern plants can plate as much as 0.006 in. per hour. Modern metallising guns spray 30 to 40 lb. of bronze in an hour.

This new aluminium-iron bronze is stronger, more corrosion-resistant, and denser than any previous metallising bronze. The alloy can be machined to a very high finish with almost any kind of tool. Judging by the report from England, the finish and density is such that it can be etched successfully.

The aluminium-iron bronze should do an excellent job on squeeze rolls, too. They have been metallised in the past with copper, but results have not been altogether satisfactory because of the porosity in the copper. The aluminium-iron bronze wears almost as well as cast iron.

#### HINTS ON BETTER METALLISING.

A number of things can be done to improve metallising results, the article continues. First, it is important to know where sprayed metals should not be used. There are three types of surfaces which are not suitable.

Sprayed metals will not stand direct impact, such as occurs on the valve seats of internal combustion engines, punches, dies, and some kinds of cam surfaces. On parts like these, there is a blow almost like that from a hammer. Sprayed metals form a thin, fairly brittle shell on a shaft, and they cannot be expected to stand many direct blows without cracking or being peened out to the point where they become loosened.

Another place where sprayed metals should never be used is on ball- or roller-bearing races; that is, where the balls or rollers will operate directly on the coating. Balls and rollers tend to elongate the surface on which they run. Sprayed metals have very low elongation. Hence, balls or rollers will stretch the coating beyond its limit and break it loose. It is, however, all right to metallise fits in housings or on shafts for ball- or roller-bearing races. Here, the coating does not come in direct contact with the balls or rollers.

Another bad spot for sprayed coatings is on threads or gear teeth. These threads or teeth are subjected to a great strain, and the tensile strength of sprayed metals is too low to take it.

The most important factor in good metallising is the right preparation for the job to be done. The self-bonding undercoat method of preparation should not be used on interrupted surfaces like shafts with keyways. Similarly, it should not be used on brass, bronze, or copper bases, or where coatings heavier than 0.080 in. are to be built up with low-carbon steel.

Whatever method of preparation is used, be sure the surface is clean and properly roughened, so that the particles of molten metal can key into the base. The self-bonding undercoat, where it can be used, automatically leaves a proper roughness for other sprayed metals. In using the material, it is a good idea to have a gas-flow meter in use with the gun. Best results, particularly with this material, are obtained with exact flame adjustment.

After preparing a surface, spray it within four hours. Otherwise, there is a chance for it to get dirty or oxidised. In the case of the self-bonding undercoat, spray immediately after cleaning up the base.

#### SELECTION OF METALS.

Sprayed coatings seldom heat up to above 250 deg. F., but they do shrink some when they cool to room temperature. Some coatings shrink more than others. In the steel group, for example, the lower the carbon content the higher the shrinkage. The 0.10 carbon steel shrinks 0.008 in., while 0.80 carbon shrinks only 0.0014 in. per inch thickness. The heavier the coating, the greater tendency there is for shrinkage. That is why heavy coatings of low-carbon steel sometimes crack. If a heavy steel coating is needed, the best metals to use would be 0.80 carbon or medium chrome, medium carbon stainless steel, which have a low shrinkage. Both of these metals are hard and have to be ground for finish, and some plants do not have grinding equipment available. In this case, build up within 0.040 in. of the desired finish size with 0.80 carbon and use 0.10 carbon near the surface. In this way, most of the coating is low-shrinkage metal, but the surface is easily machined.

Unless a repair job of an emergency nature is involved, it will pay dividends in longer life and trouble-free service to soak all metallized steel surfaces in graphited oil before putting them back in operation. Allow the part to stay immersed in oil for several hours until the coating has taken in all the lubricant it will hold. If there is not time for this treatment, brush some oil on the surface two or three times before it is re-assembled.

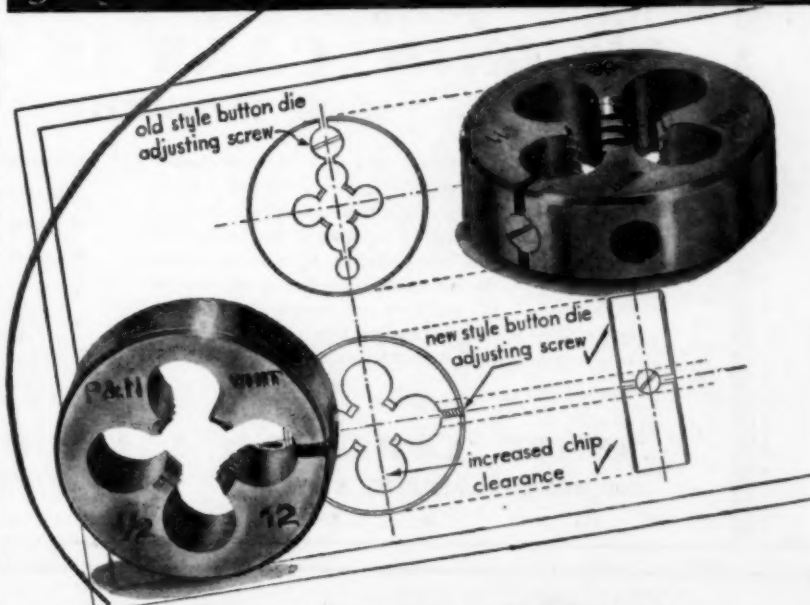
#### FINISHING SPRAYED METALS.

In machining sprayed metals, it is well to set the tool used a little above centre. This position causes a sort of burnishing action and gives a better finish to the work.

Use cemented-carbide tool bits whenever possible. These tool bits can be operated at higher speeds, and they will give a better finish on almost any sprayed metal. These

(Turn to page 53.)

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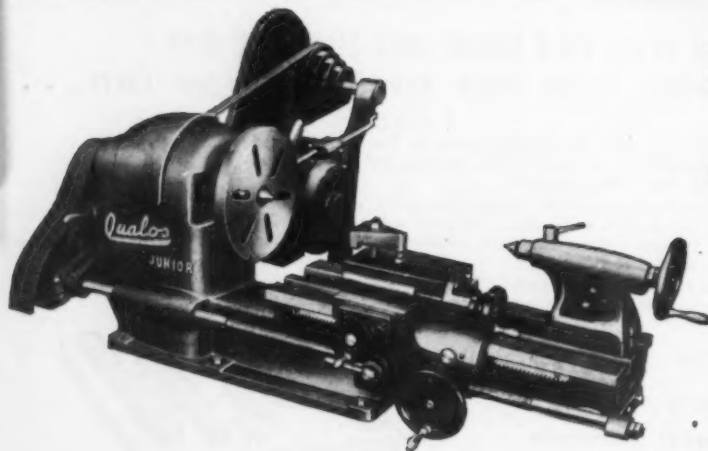
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(Continued from page 51.)

bits should also be set just above centre, with as little clearance as possible.

Where a non-corrosive coating is needed to protect a roll face that is subject to corrosion, monel, nickel, or stainless steel can be sprayed on. These metals are all somewhat porous, so they need to be sealed to give complete protection.

A good way to seal the coatings is to dip or paint with raw tung oil, or raw or boiled linseed oil mixed with 5 per cent. by volume of cobalt liquid drier. Parts should be dipped or painted while still warm after metallizing. They should not, however, be so hot that you cannot hold your bare hand on them. Thoroughly saturate the coating and allow the oil to dry for several hours before putting the part back in service.

### OPTICAL CONTROL FOR MACHINE TOOL SETTING.

The use of optical equipment on machine tools is not new, and various systems have been successfully employed—in one instance, for example, to give an enlarged image of the work and wheel on precision profile grinders. In this connection special interest attaches to an application recently introduced to

facilitate a somewhat complicated internal grooving operation.

The purpose is not to enable the operator to observe the actual work and tool, but to afford an accurate indication of the position of the tool in relation to the work, so that settings may be effected rapidly and with complete confidence solely by reference to the optical screen. With this equipment it has been possible to reduce idle time to a minimum while maintaining a degree of accuracy which would be difficult to achieve with the aid of the normal stops and graduated dials. The machine, a lathe, was designed by Alfred Herbert in collaboration with the Bristol Aeroplane Company and George Swift & Co. for machining annular dovetail grooves in the taper bore of a compressor casing for a gas turbine.

Width, form, depth, and spacing of the grooves must be held to limits of accuracy which would be difficult to maintain by using the stops and graduated dials with which a lathe of this type is normally equipped, and on the machine mentioned their use is dispensed with and the tools controlled by optical equipment supplied by the firm of Taylor, Taylor & Hobson. When the machine is cutting the tools cannot be seen, but the operator can control their movements and accurately repeat the positioning of the cutter for repetition work. In a batch of casings the grooves are machined to fine limits

solely by reference to the projector screen, without any measuring or inspection between cutting operations.

The two halves of the aluminium compressor casing are bolted together, the bore being in the form of a frustrum of a cone with 13 annular dovetail grooves. The base of each groove is parallel to the axis of the casing, and the diameter varies with the taper. The grooves are of the same size and form and of equal depth measured from the side of the bore. The corners of the dovetail is 1.160 in. plus 0.002 in., and the tolerance for groove diameter is 0.004 in.

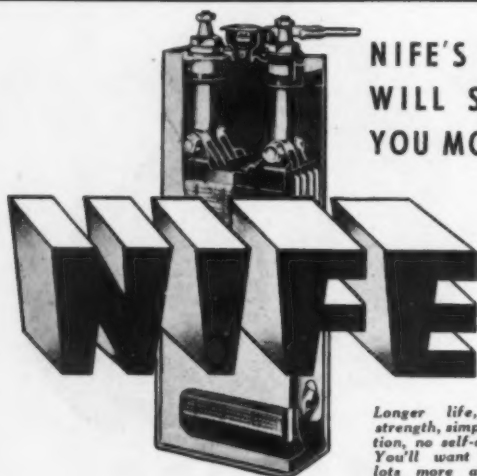
Operations on the casing include facing the end, rough and finish boring the taper, rough forming the 13 grooves from the solid, semi-finishing the grooves to produce the necessary relief at the bottoms, and finish forming the dovetail sides of the grooves. The machine is provided with a headstock which may be swivelled to any desired angle between 0 deg. and 10 deg., precise setting of the angle being obtained by the use of a slip gauge between a roller on the headstock and a plate on the bed of the machine. A variable speed motor of 25 h.p. provides the drive through the medium of a gearbox. Set at 90 deg. to the lathe bed, the cross slide carries an auxiliary slide which can be set at the same angle as the headstock, a slip

gauge being again employed to ensure parallelism.

At the rear of the bed is a bracket with guideways, and a saddle which carries the optical system. The optical equipment comprises a light source and a projector with a magnification of 50:1 on to a screen, the projector being used in conjunction with graticule holders which are bolted to a facing on the rear of the boring bar housing. The 13 grooves in the casing are machined in two series of seven and six alternate grooves, and the machine is controlled as indicated by the images on the screen. [2441].

### ROCKING TABLE PRO- DUCES CROWN SHAVED GEARS.

Gear shaving is a low pressure, free cutting gear finishing operation whereby small amounts of material are removed from the working surface of gear teeth in order to correct errors in spacing, helical angle, tooth profile and eccentricity—also to improve surface smoothness and to eliminate the possibility of tooth end load concentrations in service. This shaving process has done much to reduce the noise of gears in operation, to increase their factor of safety, load carrying capacity, and life.



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Of particular interest also to most gear makers is crown shaving, which is also known as ellipsoid tooth form, and applicable to spur and helical gears.

Gears rarely, if ever, operate as envisioned by the designer or as shown on his drawings. The teeth are usually shown as having parallel sides which are indicated by straight lines. But when consideration is given to dimensional tolerances and small errors in material, cutting, heat treatment and mountings, we can safely predict that parallelism is nearly always lost. To understand more clearly the problem of obtaining good contacts in gears, we should consider the elastic nature of related things which can, must, and do deflect when a load is applied. These include the housing, bearings, shafts and gears themselves. If a set of gears were actually parallel under one condition of loading, they cannot then be parallel with a greater or lesser load. Thus loading on conventionally straight teeth is nearly always located in small area at one end.

Actual tests have shown that off-parallel conditions do exist. The solution to the problem is to allow for deflections over which we have no control. This can be accomplished by a relative curvature between the teeth of mating gears in a manner such that interferences are eliminated.

Crown shaving does exactly this by making the teeth thinner at the ends than at intermediate points. In this way the tooth bearing and the load is kept away from the weaker ends.

On spur gears it is only necessary to crown one mate, although half the crown can be put on each mate. On helical gears it is advisable to crown each mating member a small amount.

A very small crown will allow for a noticeable deflection. A crown of 0.0003 in. in a 1 in. face width gear, if it were in the form of a true arc, would represent a radius of over 400 in. Since it is generally elliptical in shape, the radius is much larger, and hence the curvature is much less in the central portion of the gear teeth. This means that the load is not concentrated in small area as in end bearing.

Proper crowning is obtained by the controlled rocking table method wherein the shaving cutter takes the place of the mating gear and removes any material on tooth thickness or profile which would otherwise interfere in the deflected operating gear teeth. Under certain conditions a crown producing form can be ground into the shaving cutter satisfactorily.

Actual experience is stated to have shown that the ellipsoid tooth form has increased tooth strength up to as much as 200 per cent. by eliminating end bearing, and that service life has been increased as much as 4000 per cent.

Tolerances for lead and involute form on the gear should always be taken in a safe direction—thus in the direction of clearance and not

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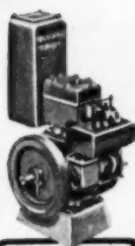
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interference. Often the normal tolerance on lead when taken in the form of a crown is sufficient to eliminate end bearing. Similarly, tolerances on involute form should allow for deflection of the teeth or rim.

The gears must have dynamic involutes and leads. [2442].

\* Extracted by B. F. Bregi in "The Machinist" from a paper read in the London Section of the Institution of Production Engineers.—Editor.

## TEMPERATURE CONTROL BY PHOTO-ELECTRIC EQUIPMENT.

For certain applications, photo-electric cells provide a very convenient means of temperature control, and have already been successfully used in connection with flash-butt welders, machines for heating bars in preparation for forging, rivet heaters, automatic chain welding machines, and eddy current heating equipment.

An example is afforded by a bar heating machine recently introduced. The equipment is suitable for heating bars by the electrical

resistance method in preparation for subsequent bending, forming, or forging operations. With the maximum input, the temperature of a 2½ in. dia. bar can be raised to 1000 deg. C. over a 22 in. length in 1 min. 44 sec., or a 1½ in. dia. bar to the same temperature over a 15 in. length in 20 secs. The temperature is held within 30 deg. C. of the pre-set value.

A Radiovisor photo-electric control cuts off the heating current when the bar reaches the required temperature and then continues to pass pulses of current at intervals to maintain the bar at the required temperature if it is not removed from the machine immediately. A filter fitted in front of the photo-cell permits only infra-red radiation to fall on it, and thus eliminates any inaccuracies which might otherwise arise due to variation of shop lighting intensity. [2443].

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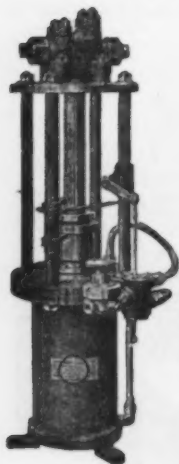
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Complete specifications lodged with the Patents Office are open to public inspection almost immediately after their lodgment. Interested persons are now able to obtain the details of an invention for which protection is being sought.

Provision is also made (Patents Act, 1946) for an applicant to obtain damages, if infringement occurs, from the date of publication of the application. A rule of practice has been established whereby an application will be examined more speedily when a prima facie case of alleged infringement is proved.

Particulars of the necessary procedure will be supplied by any Patent Attorney practising in the Commonwealth.

### PATENT SPECIFICATIONS ACCEPTED

**AUTOMATIC WINDOW-STOP.**  
136,455.—T. W. C. Akeroyd,  
N.S.W.

To eliminate the use of sash cords and weights, a part is fixed within a recessed side face of the sash and carries a wedge part which is capable of longitudinal or vertical movement in relation to the fixed part and later movement towards or away from said part, to a degree and in such manner as to adapt the wedge part to either function as a stop or wedge against the window frame so as to support the sash in any desired position or alternatively to be freed from engagement from the frame upon the application of gentle pressure to or upon and/or slight movement of the window sash when it is desired to again

adjust the position of the latter within the frame.

**CASTING CONCRETE WALLS.**  
136,454.—E. H. Bishop and W. J. Dunlop, N.S.W.

A forme unit applicable for casting curved or straight walls comprises a flexible sheet metal face plate having stiffening ribs of angle irons and tubes affixed at each end, a number of wooden battens secured on one side of the plate, a keeper plate located at each end of the battens and flexible clamping bands slidable in the keeper plates.

In an assembly of units, registration rods are passed through the tubes and adjacent units secured together by clamps, the units being spaced apart by lateral stays in association with brackets engaging the clamping bands. In the casting of cavity walls a block adapted for connect-

ing to the clamping bands is disposed between two forme assemblies.

### CONTAINER.

136,450.—P. A. M. Brookfield, N.Z.

To remove moisture from salt or the like, a container has incorporated therein a compartment for silica gel crystals, activated alumina or the like, which is separated from the substance or material in the container. The moisture passes to the silica gel crystals or alumina through a perforated fixed false bottom and the crystals may be placed in a gauze cartridge. A removable bottom is screwed in the container to permit the removal and insertion of the cartridge.

Modified forms make provision for the crystals to be inserted in a removable sliding drawer or a vertical central compartment.

### RENEWABLE HEELS FOR FOOTWEAR.

136,482.—P. H. Shaller, N.S.W.

A heel having an inclined through opening is held in place by a rubber core which has inclined walls adapted to engage walls and is affixed by screws or nails through spaced washer openings to the heel of a boot or shoe.

### TANK CLOSURE.

136,477.—W. P. Siomell, Vic.

To prevent unauthorized removal of the contents of a tank, a closure which fits the filler neck of the tank, consists of: a cover, lock housing to fit within filler neck, a gasket about the lock housing, a lock within the lock housing with at least one bolt

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operable by the lock, a slot in the lock housing to engage a pin projecting inwardly of the filler neck, and the lock operated bolt adapted to project into the slot so as to prevent disengagement of the pin from the slot.

#### COMBINED CLOSURE AND POURING DEVICE.

126,475.—Commonwealth Oil Refineries Ltd., Vic.

A body is provided with a pair of spaced threaded closure means for interchangeably fitting the delivery orifice of a container, one of the closure means being adapted to completely close the delivery orifice whilst a pouring spout having a bore integral with or attached to the body communicates with the closure means. An air vent permits the pouring of the contents of the container when the latter closure means is fitted to the delivery orifice.

#### FULLER FOR STEEL FENCING POSTS.

126,784.—J. T. Wilson, N.S.W.

To facilitate the removal of steel fencing posts without damage, a device comprises a base having an upstanding arm of U-section, a lever pivoted which serves as a fulcrum point, one end of the lever extending to a handle, the other end being fitted with a shackle chain and a member which fits over the post when pressure is applied to the lever, the member lockingly engages the post.

#### NEW TYPE CLOTHES SCRUBBER.

126,781.—J. Tritsch, Vic.

A scrubbing device in which otherwise discarded soap scraps may be used comprises a perforated box having a flat or convex bottom equipped with grooves, which present no sharp edges, and a groove running along its upper border adjacent the lid. A strap is adjustable to allow a hand to be passed therebeneath.

#### CORROSION PREVENTION DURING DISTILLATION.

126,777.—Kodak (A/asia.) Pty. Ltd., Vic.

In a process for the recovery of at least one lower aliphatic acid from aqueous liquid containing lower aliphatic acids, such as those containing from 2 to 4 carbon atoms and substantial amounts of oxygenic acids, the lower aliphatic acid is first extracted with a solvent together with gases in a quantity which would normally exert corrosive action on distillation apparatus commonly used in the recovery of such acids, and then treated by a process such as by partial vaporization to remove at least a substantial portion of the gases, followed by distillation to separate the acid from the solvent.

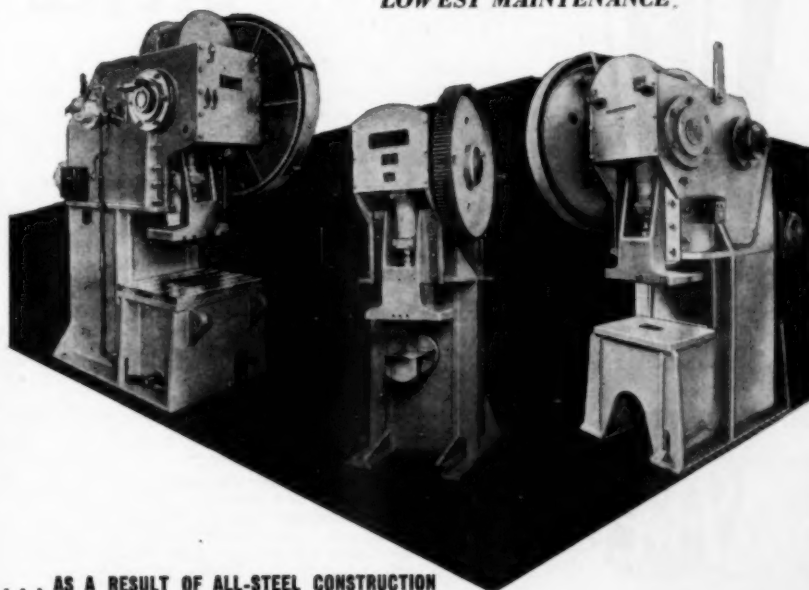
#### MOBILE TIMBER SAWING APPARATUS.

126,775.—J. A. Walter Pty. Ltd., Vic.

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- GRADE 2 — Semi-Freecutting Steel.
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- LEADER — Freecutting for specialised purposes.
- GRADE CH2 — Case hardening.

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at its inner end for connection to a vehicle so that the boom is capable of substantially universal movement about the connection. A beam member is connected at its end by a universal joint to the outer end of the boom and means such as hydraulic double acting jacks, extend between the vehicle and said members, in order to effect adjustment of said boom and beam and maintain them in adjusted positions. A saw is traversable along the beam by means of a winch and cables, and is rotated by a power take-off shaft in conjunction with universal joints, telescopic shaft and gearbox. A hand operated worm drive rotates the boom and beam when desired.

### A SHOCK ABSORBING POWER PRESS.

136,776.—H. Nickl, Vic.

To overcome shock when the clutch is engaged and to avoid undesirable braking, a power press is characterized by a supporting frame carrying an up-standing frame, a work table, a lateral extension with a guideway slidably accommodating a reciprocating ram, a pair of shafts, mounted on the frame, an up-right fly wheel, a rocking lever and ram supporting lever carried by the shaft, an endless cam slot in the flywheel, accommodating a cam follower, thrust arms pivotally connected to an adjustable nut and loosely connected to the lever by a pair of toggle links, clutch elements mounted on the thrust arms, adapted to be actuated by a spring and displaceable stop and a safety catch to hold the ram in raised position when the clutch elements are disengaged.

Modifications include a thrust face on the ram supporting lever adapted to be engaged by a displaceable clutch element.

### A NOZZLE FOR BEER TAPS.

136,758.—G. L. Dutton and H. Utermoehle, Vic.

To reduce foaming and spluttering of beer and similar liquids a sharp step is formed in the passageway of the nozzle between the valve seat and the outlet. One or more apertures are provided in the side of the nozzle below the step to break the vacuum when the tap is turned off.

### CLEANSER FOR GLASS AND PORCELAIN.

136,761.—W. A. Sinclair, N.Z.

A composition for cleaning glass, metals porcelain and the like consists of finely ground and sieved diatomaceous earth stirred in hot water into which is poured a second mixture of kerosene, stearic acid and beeswax. Preferred quantities are 60 lb. diatomaceous earth, 75 lb. water (heated to 160 deg. F.), 21 gallons kerosene, 34 lb. stearic acid and 15 ounces of beeswax.



Model Illustrated, 2BA.

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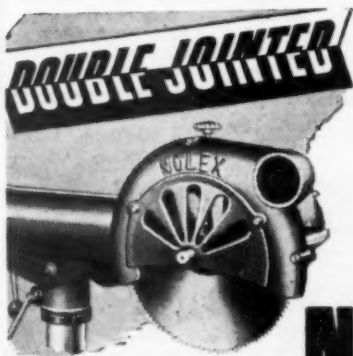
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land Kauri, 49in. x 18in.

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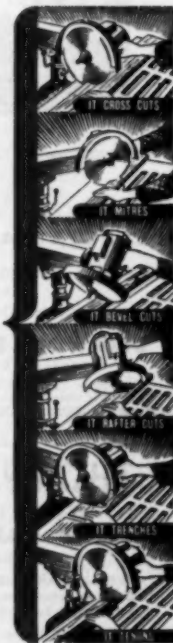
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## TENDERS FOR PATENTS

THE PROPRIETOR of Australian Patent No. 135,949, entitled "IMPROVEMENTS IN OR RELATING TO RAZOR BLADE HOLDERS", is desirous of disposing of the invention and patent outright. Particulars and illustrative literature obtainable from P. M. NEWTON & SON, 406-7 Collins Street, Melbourne.

The proprietors of Letters Patent of the Commonwealth of Australia, No. 103,455, dated 7th July, 1936, granted for "IMPROVEMENTS IN AND RELATING TO INTERNAL COMBUSTION ENGINES", are desirous of entering into arrangements with interested persons for the exploitation (either by way of licence or otherwise on reasonable terms) of the said invention in the Commonwealth of Australia. Inquiries to be addressed to

W. J. DAVIS, Patent Attorney,  
28 Martin Place, Sydney.

## "IMPROVEMENTS IN OR RELATING TO CAMERAS."

Commonwealth Patent No. 116,321. The Patentees of this invention desire that it be adopted and brought into commercial use and manufacture in Australia, and invite inquiries to these ends from persons and firms interested. Address inquiries to SPRUSON & FERGUSON, Patent Attorneys, 16-18 O'Connell Street, Sydney.

## "COMPOSITIONS CONTAINING UREA - FORMALDEHYDE CONDENSATION PRODUCTS."

Commonwealth Patent No. 104,963. The Patentees of this invention desire that it be adopted and brought into commercial use and manufacture in Australia, and invite inquiries to these ends from persons and firms interested. Address inquiries to SPRUSON & FERGUSON, Patent Attorneys, 16-18 O'Connell Street, Sydney.

## "FILTERING OR LIKE TREATMENT OF FLUIDS."

Commonwealth Patents Nos. 111,289, 112,372, 115,897, and 115,901. The Patentees of these inventions desire that they be adopted and brought into commercial use and manufacture in Australia, and invite inquiries to these ends from persons and firms interested. Address inquiries to SPRUSON & FERGUSON, Patent Attorneys, 16-18 O'Connell Street, Sydney.

## TRADE MARK APPLICATIONS

93,101. A label design showing a signal. Saucepans, boilers, frying pans, steamers, billy cans, etc.—Griffiths Brothers Limited, 26-30 Flinders Street, Melbourne, Victoria.

94,480. "Castcraft." Welding electrodes.—E. M. F. Electric Company Proprietary Limited, 901 Rathdown Street, North Carlton, Victoria.

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94,331. "Oriflo." Metal hand kerosene pump.—Brandts Pty. Ltd., 371 Pitt Street, Sydney, N.S.W.

94,211. "Curnisol." Chemical substances for use in manufactures and photography.—The Shell Company of Australia Limited, St. Helen's Court, Great St. Helen's, London, England.

94,575. "Barrelux." Composition for interior coatings of containers.—Lewis Berger & Sons (Australia) Pty. Ltd., Rhodes, N.S.W.

95,290. "Nodek." Fencing posts and repair posts.—William Way (Wimbledon) Limited, Railway Wharf, Wimbledon, London, Eng.

91,582. "Lullaby." Furniture and upholstery.—Mark Foy's Limited, Liverpool Street, Sydney, N.S.W.

95,209. "Owl." Cement roofing tile.—Samuel Foreman, 13 Bridge Road, Sutherland, N.S.W.

95,303. "Centicell." Non-electric dust removing apparatus.—James

Howden & Company Limited, 105 Scotland Street, Glasgow, Scotland.

93,977. A label design showing, inter alia, the word "Cerberus." Fire alarms, burglar alarms, alarm devices and indicating devices.—Cerberus G.m.b.H., Bad Ragaz, Switzerland.



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tric Industries Pty. Ltd., £4,792.

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Ltd., £282/1/1.

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6223). Spicers (Aust.) Pty. Ltd.,  
£450.

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Mfg. Co., £1,600/2/6; Telephone  
Manufacturing Co. (A'asia.) Ltd.,  
£762/1/8; Flight Bros., £2,061/7/1;  
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Pty. Ltd., £416/5/-; Standard Tele-  
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Bros. Pty. Ltd., £1,025.

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No. C.6061). Johnston & Gaston  
Pty. Ltd., £370/16/8.

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No. C.6196). Hawker Richardson  
& Co., £1,696; Heine Bros.

(A'asia.) Pty. Ltd., £1,435/15/6;  
and John Lysaght (Aust.) Pty.  
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Electric Co. (Aust.) Ltd., \$7,580.

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Radio Receivers (Sch. No. C-  
5766). R. H. Cunningham & Co.,  
£600.

Cable Jointing Pits (Sch. No.  
6106). Everhard Concrete Pro-  
ducts Co., £7,750; and Bucklands  
Concrete Works (S.A.) Pty. Ltd.  
Rates.

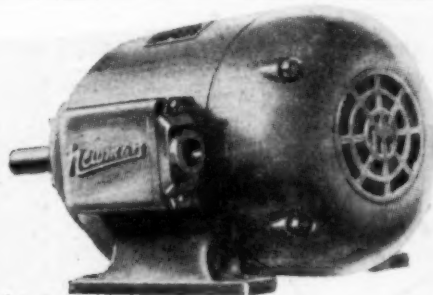
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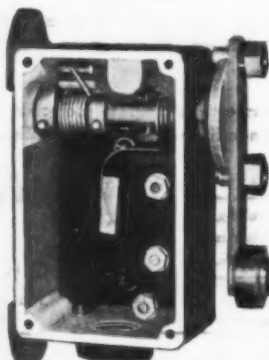
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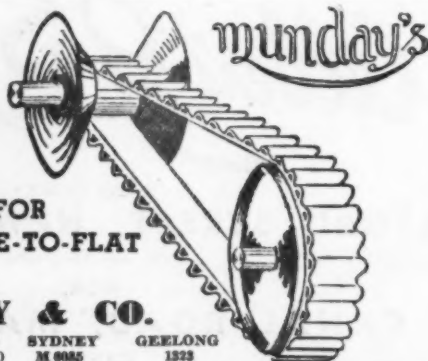
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(Continued from page 28.)

for the driver, and the portion occupied by his assistant—who is also a relief driver—is equipped with a table and comfortable seating room. A Healing mantel radio has been added as an amenity during long runs.

Averaging between 300 and 500 miles a week, the Display-Mobile is staffed by two experts in the person of Mr. Cliff Barratt and Mr. Geoff. Maltby. Mr. Barratt will no doubt be a familiar figure to many people within the trade, as he has been connected with the tool department of A. G. Healing Ltd. for a number of years.

With a large itinerary ahead of it, including Victoria, New South Wales and South Australia, the Healing Display-Mobile has already covered a large part of Victoria and portions of New South Wales. In providing this excellent service, Mr. Barratt and Mr. Maltby say they have been greatly helped by the co-operative spirit and goodwill that has been in evidence wherever they have called.

### NEW FACTORY REGISTRATIONS

#### NEW SOUTH WALES.

A.M.E. Furniture Pty. Ltd., 3 Beeson Street, Leichhardt—Furniture and Cabinetmaking.

Raard Plastics Pty. Ltd., Herbert Street, Artarmon—Plastic Goods.

Roma Manufacturing Co., 137 Belmont Street, Alexandria—Clothing.

John William Adair, 19 Monroe Avenue, Kirrawee—Furniture and Cabinetmaking.

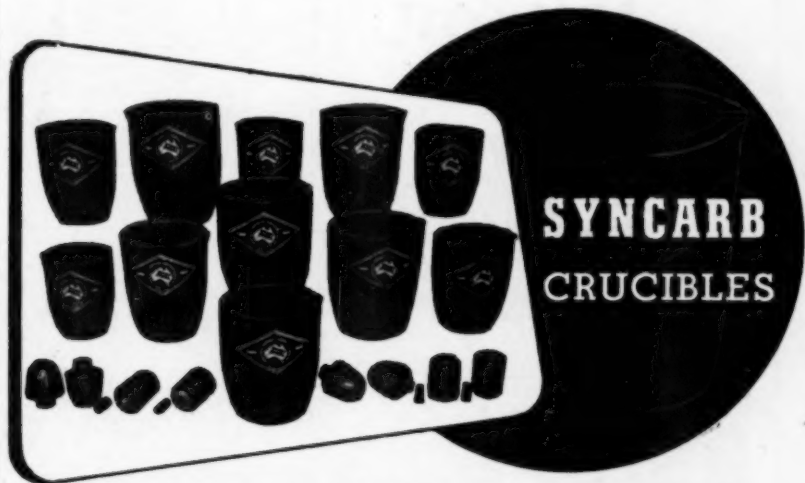
Advance Shoe Co. Pty. Ltd., Cooper and Elizabeth Streets, Sydney—Ladies' Shoes.

Armstrong Industries Pty. Ltd., 168 Pacific Street, Greenwich—Kitchenware.

Anson & Clarke, 690 Botany Road, Mascot—Sheet Metal-working.

Banon & Rawson Pty. Ltd., Janet Street, Leichhardt—Tools.

E.S.E. Shoe Co., 11 Darley Street, Kogarah—Boots and Shoes.



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clay Mullins, Crucibles.

Syncarb graphite crucibles are bonded entirely by carbon residues and offer, as a result, a number of cost-saving and operating advantages over conventional-type crucibles, as, for instance, lack of any necessity for annealing before being put into service.

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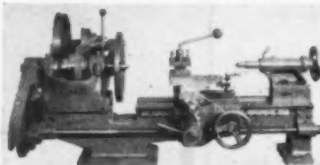
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H. Blyth & Sons, 34 Bartlett Street, Summer Hill—Furniture.  
Brink & Davis, rear 585 Gardeners Road, Mascot—Welding.  
Baltic Sweets, cr. Carrington and Ely Streets, Revesby—Confectionery.

F. Burchall, 27 Anderson Road, Concord—Joinery.  
Busby & Tilley, rear 1623 Botany Road, Botany—Boots and Shoes.

College Clothing Co., 13 Evans Street, Balmain—Clothing.  
Corneal Lens Corporation Pty. Ltd., 8 Albion Street, Sydney—Optical Appliances.

The Adeldon Knit, 16 Sydney Road, Manly—Clothing.  
Derwent Tool Eng. & Plastic Co. Pty. Ltd., 58 Derwent Lane, Glebe—Tools and Dies.  
S. Dight, 42 Dudley Road, Rose Bay—Upholstery.

#### VICTORIA.

Briggs, Ellis; Griffiths, Rundle, Sherbourne Road, Briar Hill—Saw Sharpening, etc.  
White, R., Sherbourne Road, Briar Hill—Cement.

Forward, C. & C., 67 Thistlewaite Street, South Melbourne—Wrought Iron Work.

Hunt, J. N. J., 127 Gherinap Street, Geelong—Cement Tiles.  
Hughes, W. A., Allenby Street, North Coburg—Frams.

Rosedale, G. & F., 14/16 Celestial Avenue, Melbourne—Buttons.  
Townsend, C. F. E. & J., 4 Sydenham Street, West Footscray Paper Bags.

Smith Bros. Pty. Ltd., McDonald Road, Brooklyn—Sawmill.  
Spicers (Aust.) Ltd., Sydney Street, Kilmore—Stationery.

Melodys Pottery Pty. Ltd., Meefield Road, Campbellfield—Bricks.

Heather, H. J., Plenty Road, Mernda—Ladies' Footwear.

Battery Equipment Supply Co. (Vic.) Pty. Ltd., 180 Bay Street, Port Melbourne—Storage Battery Plates.

Davis, W. C., Jack Road, Cheltenham—Paints, Varnishes.

Pitts, R. F., 14 Gladstone Place, South Melbourne—Welding Engineers.

Lead Products Pty. Ltd., 180 Bay Street, Port Melbourne—Lead Oxide.

Dynon Fabrics Pty. Ltd., Dynon Road, West Melbourne—Textile Waster.

Rayneon Signs Ltd., 180 Bay Street, Port Melbourne—Neon Signs, etc.

#### FOUR MEALS A DAY?

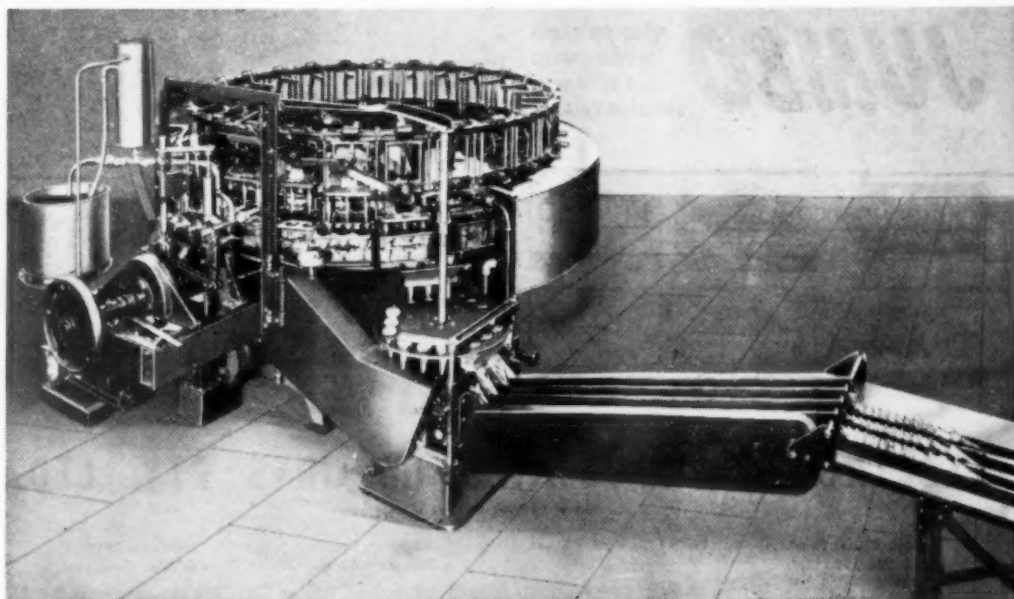
American companies are studying a plan that would alter the "lunch-hour" system practiced generally by industry in the United States. Under the plan, morning and afternoon eating periods would take the place of the present lunch hour at noon.

The idea results from recent experiments conducted at Yale University which indicate that the human organism does not work at its best under the traditional three-meal-a-day system. It does better if the same amount of food is distributed over four meals studies show.

It is the experience in industry, notes the magazine "Business Week," that a workman produces more at the start of each working day and that his work output tapers off before lunch. After lunch he is again more productive, and in mid-afternoon he again slows down. Most companies feel that mid-morning and mid-afternoon light refreshments would increase the efficiency of their workers but not to the extent that more leisurely lunch periods would.

One of America's largest department stores, Marshall Field and Company of Chicago, recently installed the new lunch-hour system to keep certain sales counters fully staffed at noon, when business is heaviest. Now, instead of an hour at noon and 15-minute morning and afternoon rest periods, the sales people at these counters take 45 minutes sometime before noon and another 45 minutes in mid-afternoon.

These employees, who participate voluntarily in the change, like it, says "Business Week." By eating earlier in the morning, they avoid crowds at eating places at noon; in the afternoon they have enough time for another meal and also to conduct personal business.



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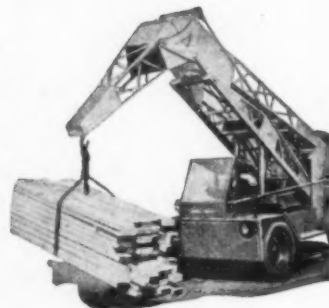
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# CURRENT TENDERS

## NEW TENDERS

The following tenders have been called since our last issue. Current tenders which have been published in previous issues follow this section.

### COMMONWEALTH

DEPARTMENT OF SUPPLY.  
Gauges, dial type. May 4.  
Multimeters. May 9.  
Patrol Waggon. May 4.  
Petroleum Products. May 4.

Vertical Boring and Turning  
Mill. May 11.

### POSTMASTER-GENERAL'S DEPARTMENT.

Barretters (Sch. C.6293). July 11.

Condensers (Sch. C.6292). July 20.

Electric Soldering Tools (Sch. C.6308). May 25.

Hand Postmarkers (Sch. C-6271). May 5.

Metal Anchors, Drills, and Clips, for Masonry (Sch. C-6294). May 16.

Post Office Scales and Weights (Sch. C.6284). July 18.

Printed Forms, "Costing" Series (Sch. C.6309). May 9.

Printed Basic Drawing Sheets (Sch. C.6185). May 16.

Spindles, Steel (Sch. C.6286). June 13.

Tents, Flies and Tarpaulins (Sch. C.6215). May 18.

Testing Instruments (Insulating Resistances), (Sch. C.6289). July 13.

### GOVERNMENT RAILWAYS DEPARTMENT.

Dogsplikes. May 9.

Fishbolts. May 9.

Rail Anchors. May 9.

Spring Washers. May 9.

## STATES

### NEW SOUTH WALES

#### GOVERNMENT RAILWAYS DEPARTMENT.

Air Operative Multivene Motor Sump Pumps (Sch. CE-2643). May 10.

Air Driven Winches, single drum (Sch. CE-2641). May 11.

Electric Winch, for 10 ton Back Leg Crane (Sch. CE-1862). May 17.

Lighting Sets, portable engine driven (Sch. CE-6224). May 3.

(Turn to page 71.)

# NICHROME

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### NEW TENDERS - Contd.

Tunnel Diesel Locomotives,  
light-weight (Sch. CE-2642). May  
18.

#### DEPARTMENT OF MAIN ROADS.

Bronze Castings. May 2.  
Concrete Pipes. May 2.  
Injector Nozzles, Valves and  
Bodies. May 2.  
Magnesite. May 2.  
Flywood. May 2.  
Ready Mixed Concrete. May 2.  
Turnbuckles. May 2.  
Volume Grease Guns and  
Lubricant Volume Compressors.  
May 2.

#### ♦ ♦ SEE ALSO ♦ ♦ "LATE OPEN TENDERS"

#### FORESTRY COMMISSION.

Die Nut. May 2.  
Filament Transformers. May 2.  
Regrinding Radio Crystals. May  
2.  
Socket Set. May 2.  
Stocks and Dies. May 2.

#### ROAD TRANSPORT AND TRAMWAYS.

Centre Lathes (2). May 8.  
Slotting Machine. May 8.  
Vertical Milling Machine. May  
8.

#### STATE CONTRACTS CONTROL BOARD.

Cotton Waste. May 9.  
Engineers' Machinery. May 1.  
Lubricants and Oils. May 9.  
Marine Engines. May 9.  
Motor Alternator Unit. May 2.  
Tools for Carpenters and Engi-  
neers. May 9.

Tractor, Trailbuilder and Power  
Control Unit, Purchase of. May  
9.

Weighing Machines and  
Weights. May 9.  
Wire, Wire Nails, etc. May 9.

#### SYDNEY COUNTY COUNCIL.

Jib Crane, one ton, second-  
hand, Purchase of. May 1.

Metalclad Switchgear, 11,000  
volt, 250 M.V.A., for Mascot Sub-  
station (Spec. 1303). Extended to  
May 18.

Oil Cooling Equipments (2).  
May 1.

Power Transformers (12,500  
K.V.A.), for Sub-stations (Spec.  
1354). Extended to June 8.

Steel Economiser Tubes, solid  
drawn, for Section "B", Bun-  
nerong Power Station (Spec.  
1410). May 25.

#### WATER CONSERVATION AND IRRIGATION COMMISSION.

Disc Harrows, 2 Sets. May 11.  
Drill Cultivator. May 11.  
Road Grader, Drawn Type. May  
11.  
Wheeled Tractors (2), Pneu-  
matic Tyred. May 11.

#### METROPOLITAN WATER, SEWERAGE AND DRAINAGE BOARD.

C.I. Flanged Fittings (60 tons).  
May 23.

Centrifugal Type Pumping  
Units, (2), elect. driven, vertical  
spindle, for Homebush Sub-  
station. Extended to June 8.

Combined Passenger and Goods  
Lift, elect. driven and controlled  
for Bondi Outfall Treatment  
Works. June 8.

Portable Electric Drills (12),  
Portable Electric Grinders (6)  
P.E. Senders; (3) P.E. Saws (3);  
and Portable Pneumatic Grinders  
(6). May 9.

Pumping Unit, Electrically Driven,  
Centrifugal Type, for Kil-  
lara. Extended to June 6.

Pumping Units (2), Electrically  
Driven, Centrifugal Type, for  
Coledale. Extended to June 6.

Radial Drilling Machine, Mo-  
torised, 60 inch arm, new or  
s.h. May 10.

Steel Benches (12), and Tool  
Cabinets. May 5.

#### MISCELLANEOUS.

Diesel Autopatrol Grader, tan-  
dem drive, with hydraulically  
operated controls, 12 ft. blade,  
Scarifier, etc., for Shire of Stroud.  
May 22.

Medium Grader (12,000-15,000  
lb.), and Heavy Duty Grader, for

(Turn to page 72.)

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**TWO-INCH 3-JAW**

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Universal Chuck with  
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### NEW TENDERS — Contd.

Copmanhurst Shire Council. May 15.

Motor Patrol Grader, approx. 15,000-15,000 lb., fitted with blade and scarifier, for Shire of Wingecarribee. May 15.

Pneumatic Tyred Tractor, 15-15 h.p., suitable for fitting a motor scythe to, and for drawing Gang Mower, for City of Tamworth. May 1.

Scum Separation Equipment, for Wade Shire Council. May 30.

Tractor Drawn Gang Mower, for Municipality of Randwick. May 16.

Transformers—one 75 KVA 6,600/415/240 volt., and one 200 KVA, 22,000/415/240 volt., for Shire of Wakool. May 15.

Transformers (14), of various sizes, for New England County Council. May 20.

Refrigerator, kerosene operated, household type, for Underbool. May 9.

Sawdust Extraction Equipment, for Caulfield. May 9.

Sawdust Extraction System, for Gresswell Sanatorium, Mont Park. May 2.

#### MELBOURNE AND METROPOLITAN BOARD OF WORKS.

Travelling Blocks (2), chain operated, with 6 ton working capacity. May 1.

#### MELBOURNE HARBOUR TRUST.

Fork Lift Truck, 15,000 lb. capacity, 10 ft. mast and 6 ft. forks. May 5.

M.S. Reinforcing (300 tons), 1 1/2 inch diameter. May 5.

M.S. Plates (26 tons). May 12.

Mobile Cranes (12), 2-3 ton capacity. May 12.

#### MISCELLANEOUS.

Air Compressors, Motors, and Ejector Equipment—2 Cyl. 8 in. x 6 in. Air Compressors, V belt driven; Reconditioned Cylinder Block and Set of Valves, for these compressors; K.L. Unloader; 40-h.p. A.G.E. Electric Motor; 15-h.p. A.G.E. Electric Motor; 25-h.p. In-ventible Kerosene Engine; 8 ft. x 5 ft. diam. Air Receivers, with Wheel Valve; 150 gal. Sewage Ejectors; a quantity of 3 in. and 4 in. Air Piping, with Valves and Fittings; Switchboard, Switches, and Pressure Gauges, for above Plant. Purchase of, from Swan Hill Sewerage Authority. May 11.

Steam Roller (10 ton), Purchase of, from Shire of Kyneton, May 12.

#### QUEENSLAND

#### STATE ELECTRICITY COMMISSION.

Alternator, 6.6 KV, 125 KW (Spec. 194). July 19.

(Turn to page 73.)

### VICTORIA

#### CITY OF MELBOURNE.

Castings, non-ferrous, and iron. May 8.

Fuel Oil and Distillate. May 2.  
Steam Turbines (2), vertical spindle, non-condensing. May 1.

#### DEPARTMENT OF PUBLIC WORKS.

Central Heating System, for Melbourne Technical College. May 9.

Food Trolleys and Sundry Equipment (electrically heated), for Coburg. May 2.

Fuel Hot Water Service, for Kyneton. May 2.

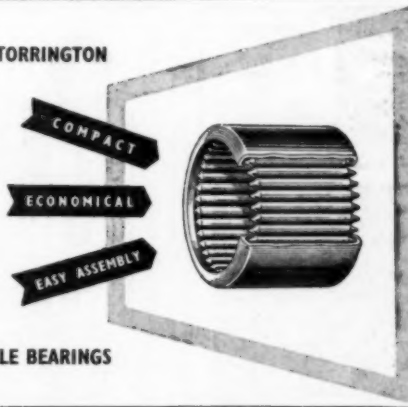
Fuel Hot Water Service, for Bairnsdale. May 2.

Mechanical Ventilation System, for Royal Park Mental Hospital. May 2.

Potato Peeler, for Coburg. May 2.

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### NEW TENDERS — Contd.

C.I. Pipes and Specials, C.I. Twin Strainers and C.I. Gate Valves for Air and Oil Cooler Circulating Water (Spec. 212). June 21.  
Coal Handling Plant, for Gas Producers, for Longreach Shire Council (Spec. 199). Extended to May 17.  
Power House Switchgear, low tension (Spec. 203). June 21.  
Steam Turbo Alternators (Spec. 200). Aug. 30.  
Water Tube Boilers (Spec. 200). Aug. 30.

### WEST AUSTRALIA

#### GOVERNMENT TENDER BOARD.

Mild Steel Plate, 1, 3/16 and 9/16 inch. May 25.  
Patrol Grader, second-hand. Purchase of. May 4.  
Pumps—G.W.S. Norseman, Extension. May 25.  
Wheels and Axles (6,000 pairs), for Railways. Extended to May 18.

### CURRENT TENDERS

The following tenders have appeared in previous issues and are still current.

### COMMONWEALTH

#### POSTMASTER-GENERAL'S DEPARTMENT.

Adhesive Insulating Tape (Sch. C.6247). May 7.  
Communication System between Sydney and Melbourne (Spec. C-6157). Oct. 5.

Exchange Maintenance Parts (Sch. C.6243). May 2.  
Insulated Wire (Sch. C.6263). June 6.  
Maintenance Parts, for Long Line Equipment (Sch. C.6262). June 1.  
Motor Generators (Sch. C.6276). June 6.  
Postmarkers, Hand, Steel (Sch. C.6271). May 4.  
Wire, G.I. Steel Stranded (Sch. C.6275). June 1.  
Woodworkers' Tools (Sch. C-6251). May 11.

#### DEPARTMENT OF CIVIL AVIATION.

Automatic Voltage Regulators (Sch. 288). May 9.  
Fire Extinguishers (Sch. 290). May 16.  
Fire Trailer Units (Sch. 289). May 23.  
Mild Steel (Sch. 287). May 30.  
Mechanical Side Loading Attachments (Sch. 291). May 9.  
Power Transformers (Sch. 286). May 2.

#### GOVERNMENT RAILWAYS DEPARTMENT.

Diesel Powered Rail Cars (3 ft. 6 in. gauge). June 6.

### STATES

#### NEW SOUTH WALES

#### GOVERNMENT RAILWAYS DEPARTMENT.

Brass Die Castings (Lock Bodies). (Sch. CE-2636). May 2.  
Carrier Telephone System, 12 channel (Spec. 81). Extended to May 17.  
Drain Cocks (6), for Air Reservoirs (Spec. 2114). May 3.  
Embossing Press (Sch. CE-1824). May 18.

Frequency Modulated Radio Apparatus (Spec. 83). May 31.  
Insulators (11 KV). (Sch. CE-1806). May 1.  
Platform Trucks, Battery Operated, 2 ton capacity (Sch. CE-1838). May 25.  
Pressure Gauges (6), 6 inches nominal dia. May 3.  
Rectifier Units (4,000 KW) and Energy Dissipating Resistor Units (Spec. 1259). July 12.  
Riveted Air Reservoirs (6), each of approx. 84 cu. ft. cap. (Spec. 2113). May 3.  
Safety Valves (6), trigger type, spring loaded, 2 1/2 inch diameter (Spec. 2114). May 3.  
Single Line Grab, 13-15 cu. ft. (Sch. CE-2628). May 2.  
Transformers (2), 50 KVA, for Beilmore Sub-station (Spec. 1261). May 10.  
Transformers (20), 50 KVA, for Railway Sub-station (Spec. 1262). May 10.

#### DEPARTMENT OF MAIN ROADS.

Membrane Sealing Compounds (200 gals.), for curing concrete. June 15.  
Trench Roller, Self Propelled. May 18.

#### DEPARTMENT OF WORKS AND HOUSING.

Compressed Air Service, for Lidcombe P.M.G. May 2.  
Low Voltage Air Circuit Breakers (30 M.V.A.) and Switch-fuse Equipment, for Captain Cook Dock. Extended to May 2.  
Switching Equipment, 11,000 volt, for Captain Cook Dock. Extended to May 2.  
Weighbridge (20 ton), for Postal Stores. May 2.

MARITIME SERVICES BOARD.  
Fire Pumping Unit, high pressure. Extended to May 15.

(Turn to page 74.)



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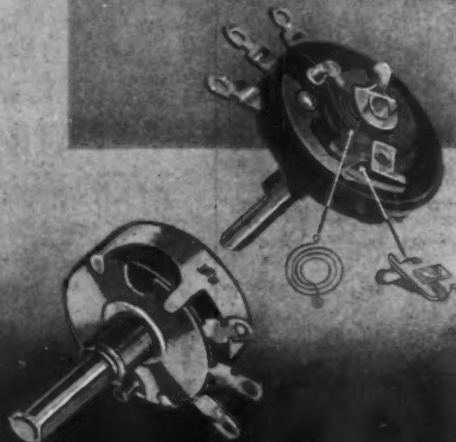
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### CURRENT TENDERS — Contd.

#### METROPOLITAN WATER, SEWERAGE AND DRAINAGE BOARD.

- Air Operated Tunnel Loaders (5). May 9.
- Compression Testing Machine (250 ton). May 16.
- Electric Storage Battery Locomotives (6). May 9.
- Electrically Driven Vertical Spindle Centrifugal Type Pumping Units (2). May 2.
- Fluorescent Light Fittings. May 2.
- Pumping Units (2). Electrically Driven, Centrifugal Type, for Dapto Booster Pumping Stations. May 2.
- Salt Glazed Ware Pipes and Fittings. May 2.

#### STATE CONTRACTS CONTROL BOARD.

- Automotive Tools. May 2.
- Cement Tube. May 2.
- Rope, Thread and Twine. May 2.
- Scientific Apparatus. May 16.
- Slicing Machines. May 2.
- Tarpaulins, Tents, etc. May 2.
- Vacuum Cleaners and Floor Polishers. May 2.

#### SYDNEY COUNTY COUNCIL.

- Aerial Service Cable (Spec. 1378). Extended to May 4.
- Air Break Isolating Switches, for Support Insulators (Spec. 1386). June 15.
- Bare Copper Cable and Copper Wires (Spec. 1379). Extended to May 11.
- Booster Regulators, for Low Voltage Distributors (Spec. 1384). June 8.
- Cast Hotplates, for Electric Ranges (Spec. 1399). May 11.
- Coal Handling Plant, for Bunnerrong "B" Power Station (Spec. 1400). May 13.
- Compensators and Relays, for Voltage Regulating Equipment (Spec. 1407). June 22.

Current Limiting Reactor, oil immersed, for City Sub-station (Spec. 1348). May 25.

Dressed Castings of Moving Tugger Wedges. May 4.

Iron Castings. May 3.

Ironclad Cutouts (400), 200 amp. May 2.

Lightning Arresters. 122,000 volt. (Spec. 1385). May 25.

Miscellaneous Piping (Additional), for Pymont "B" Power Station (Spec. 1393). May 11.

Non-Ferrous Castings. May 3.

Oil Immersed Current Limiting Reactors for City Sub-station (Spec. 1348). May 25.

Power Transformers (13,500 K.V.A.), for Sub-stations (Spec. 1361). June 1.

Single Conductor, Varnished Cambric Insulated Cable (11,000 volt.), (Spec. 1391). May 25.

Steam Generating Plant for Logans River Station (Spec. 1310). Extended to April 30.

Structural Steelwork for Turbo-Alternator Foundations, for Pymont "B" Power Station (Spec. 1395). May 4.

Structural Steel Framework, for Coal Handling Plant, Bunnerrong "B" Power Station (Spec. 1404). May 11.

Switchgear (440 volt.), for Salt Water Pumps, Bunnerrong Power Station (Spec. 1401). May 15.

Varnished Cambric Insulated Cable, single conductor, 11,000 volt. (Spec. 1391). May 4.

#### MISCELLANEOUS.

Diesel Patrol Grader, heavy duty, with Scarifier Equipment, for Yanco Shire Council. May 8.

Concrete Mixer, half bag, machine driven, with rubber tyred wheels, for Shire of Jerrilderie. May 10.

Hydraulic Regulating Valves (37), for Central Tablelands County Council. Extended to May 22.

Materials—Cement, Emulsion, Pipes and Road Binders, for

(Turn to page 75.)



## NON-FERROUS CASTINGS

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castings, approx. 3H.  
high.

Capacity is available for the production of non-ferrous castings, in production quantities in ALUMINIUM ALLOYS, sand or permanent mould chill cast, either fully heat-treated and aged or with precipitation treatment, also in BRASS BRONZE and GUNMETAL ALLOYS, sand cast, both single and multiple spray castings, as required by Engineering and Industrial users.

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### CURRENT TENDERS - Contd.

Municipality of Randwick. May 16.

Road Machinery—Crawler Tractor (44 in. tread), approximately 40 horse power, and 9,800 lb. in weight; Tractor to be fitted with an Angledoor. Automatic Tractor Wheel Scoop, 4 ft. 6 in. bowl width, capacity 28 to 36 cubic feet, for Liverpool Plains Shire. May 11.

Supervisory Remote Control Equipment, for Newcastle City Council. Extended to May 8.

### VICTORIA

#### GOVERNMENT RAILWAYS DEPARTMENT.

Addressing Machines. May 3.  
Common Battery Switchboard, floor type. June 7.  
Duplicating Machines. May 3.  
Embossing Machines. May 3.

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Letterpress Printing Machine, quad crown, two revolution. May 24.

P.A.B.X. Equipment, Manual Telephone Switchboard Power Plant and Telephones. June 7.

Power Plant and Telephones. June 7.

Radial Drilling Machine. May 3.  
Switchboards and Telephones. June 7.

#### CITY OF MELBOURNE.

Bolts, Nuts, Coach Screws, etc. (Spec. 709/E). May 8.

Braided Aerial Cables (Spec. 710/E). May 8.

Gas-filled and Vacuum Lamps (Spec. 707/E). May 8.

Insulating Material (Spec. 708/E). May 8.

O.H. Travelling Cranes, electrically operated (2), 10 ton (Spec. 704/E). June 14.

Road Traffic Control Signals. Extended to June 21.

Steel Conduits (Spec. 711/E). May 8.

Structural and Reinforcing Steel. May 2.

Universal Milling Machines (2). May 2.

V.I.R. Cable (Spec. 712/E). May 8.

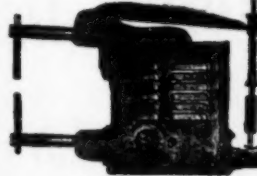
#### POSTMASTER-GENERAL'S DEPARTMENT.

Platinum Wire (Sch. V.340). May 2.

#### STATE ELECTRICITY COMMISSION.

Air Operated Tunnel Loaders, 2 of 1 ton and 2 of two ton capacity (Spec. 49-50/292). May 19.

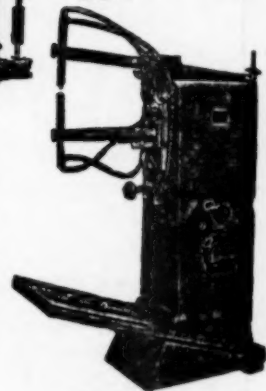
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WELDERS FEATURE:  
Special electrode alloy for dissimilar metals.  
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Lower arm adjustable, giving deep spot.  
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ELECTRICAL AGENCIES, 193 ELIZABETH STREET, BRISBANE.

Derrick Cranes, electrically operated, 5 and 10 tons (Spec. 49-50/309). May 10.

Equipment of Centralised Control of Consumer Loading (Spec. 49-50/171). June 21.

Fuel Oil Centrifuges (Spec. 49-50/302). May 3.

Main Distribution Boards (400 V.), and Air Circuit Breakers (Spec. 49-50/290). May 17.

O.H. Travelling Cranes, electrically operated, 5-10 ton (Spec. 49-50/309). May 10.

Submersible motor driven Bore Hole Centrifugal Pumps (Spec. 49-50/288). May 10.

Switchgear (220,000 volt.) and Accessories (Spec. 49-50/251). Extended to July 26.

Telephone Cable (Spec. 49-50/291). July 12.

#### STATE RIVERS AND WATER SUPPLY COMMISSION.

Electric Pumping Units (4), motor-driven, for Red Cliffs. June 30.

#### MISCELLANEOUS.

Traffic Lights, for City of Coburg. May 8.

Water Filtration and Purification Plant:—Flocculating and Sludge Scraping Mechanisms; Filter Control Valves; Rate Controllers, Indicators, and Connecting Pipework; C.I. Pipes and Fittings, for Treatment Plant Units; Chemical Dry Feeders, etc.; Solu-

tion Mixing Equipment, Chlorinator Equipment, etc., for Mildura Urban Water Trust. July 10.

Water Purification Plant:—Flocculating and Sludge Scraping Mechanism; Filter Control Valves; Filter Rate Controllers, etc.; Cast Iron Pipes and Fittings; Supply of Chemical Dry Feeders, for Shepparton Urban Water Works Trust. June 21.

### QUEENSLAND

#### BRISBANE CITY COUNCIL.

Air Break Switches and Isolators. May 15.

Cable, 33,000 volt., and Pilot Cable. June 8.

Maximum Demand Indicators. May 12.

Oil Circuit Breakers, 33 kv, 400 amp, 750 mva. May 19.

Polyphase, A.C., Watt-hour Meters. May 12.

#### STATE ELECTRICITY COMMISSION.

Alkaline Battery and Charging Set (Spec. 202). May 2.

Centrifugal Pumps (Spec. 217). May 24.

Circulating Pump, cooling tower, motor driven (Spec. 210). May 17.

Coal Handling Plant, for Gas Producers (Spec. 190). May 8.

(Turn to page 76.)



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St., AUCKLAND. N.S.W.—HOWARD VAUGHAN (AUST.) PTY. LTD.,  
382 Kent St., SYDNEY.

## CURRENT TENDERS — Contd.

Cooling Tower Circulating  
Pump, motor driven, complete  
(Spec. 210). May 17.

Crude Oil Engine (750 H.P.) and  
Alternator. May 3.

Electric Generating Plant, Oil  
Engine Driven (Spec. 181). May  
10.

Fire Protection Equipment (Spec.  
173). May 24.

Generating Plant, gas-cum, oil  
engine driven, for Charleville  
(Spec. 208). June 7.

Metering Equipment (Spec. 201).  
May 3.

Oil Engine Driven Elect. Gener-  
ating Plant (Spec. 181). May 10.  
Steam and Water Valves, high  
and low pressure (Spec. 193). May  
24.

Steam Turbo Alternator (Spec.  
196). Aug. 16.

Wood-burning Gas Producer  
Plants (Spec. 192). May 31.

## GOVERNMENT RAILWAYS DEPARTMENT.

Diesel Electric Locomotives (10).  
June 30.

## MISCELLANEOUS.

Alternator Units. Internal  
Combustion Engine Driven, for  
Brisbane and Warroo Shire Coun-  
cil. May 2.

Distribution Transformers, 3-  
phase. Extended to May 22.

Equipment—Electric Generating  
Set, portable; Earth Boring Ma-  
chine; Portable Power Driven  
Saw, for Townsville Regional  
Electricity Board. June 5.

Mild Steel Plate, 1,500 tons, for  
Townsville City Council. May 18.

Pumps and Motors and Water  
Level Indicator, for Chinchilla  
Shire Council. May 8.

## SOUTH AUSTRALIA

### SUPPLY AND TENDER BOARD.

Carrier Telephone System.  
June 19.

Carrier Telephone System.  
May 15.

Marine Diesel Engine, 30 h.p.  
May 22.

## WEST AUSTRALIA

### GOVERNMENT TENDER BOARD.

Channel Carrier Telephone  
Equipment (3), and Associated  
Apparatus. May 11.

Floating Dredge Plant Ex-  
tended to May 11.  
Transformers, for S.E.C. May  
4.

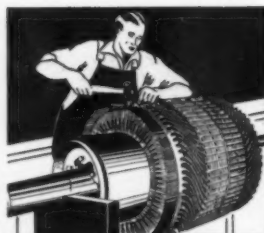
Travelling Crane (40 ton), for  
Railways. May 13.

## NEW ZEALAND

### HYDRO ELECTRIC DEPART- MENT.

Electric O.H. Travelling Cranes  
(2), 4 motor, 80 ton. May 30.

(Turn to page 77.)

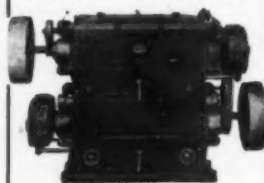


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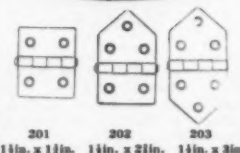
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#### CURRENT TENDERS—Contd.

Generators, 27,777 kVA. May 2.  
O.H. Travelling Crane (25 ton).  
Electric. May 9.  
Outdoor Switchgear, 110 k.v.  
June 6.  
Switchgear, 100 k.w. May 10.  
Transformer Banks, 27,777 k.v.a.  
(4), end spare unit. June 13.  
Turbines, 35,000 h.p. May 2.

#### Accepted Tenders

##### COMMONWEALTH

##### STORES, SUPPLY AND TENDER BOARD.

Paper, for Government  
Printers (Sch. No. 806). Aus-  
tralian Paper Manufacturers  
Ltd., £208/4/4; (Sch. No. 807).  
Wiggins, Teape & Alex. Pirie  
(Export) Ltd., £5,951/10/-.  
Lettercard Board (Sch. No.  
741). Spicers (Export) Ltd.,  
£54g.446.

Steel Safes (Sch. No. 828). The  
Ajax Safe Co., £5,097/9/10; and  
Bulldog Safe Works, £3,867/18/-.  
Polishing Wax (Sch. No. 843).  
V.E.N. Sales & Services Pty.  
Ltd. Rates.

Fire Fighting Equipment, etc.  
(Sch. No. 845). Fire Fighting  
Equipment Pty. Ltd., Harrison's  
Ramsay Pty. Ltd., Wormald  
Bros. (East) Ltd., Nu-Insul Insu-  
lation Co., and Fire Extinguishers  
Pty. Ltd. Rates.

General Stores, Handles, etc.  
(Sch. No. 846). John Perry Pty.  
Ltd., Briscoe & Co., and Hard-  
ware Co. of Aust. Pty. Ltd.  
Rates.

Cotton Waste (Sch. No. 846). J.  
A. Witter & Co. Rates.

Motor Spirit, etc. (Sch. No.  
847). Commonwealth Oil Refin-  
eries Pty. Ltd., The Shell Co. of  
Aust. Ltd., Caltex Oil (Aust.) Pty.  
Ltd., and Atlantic Union Oil Co.  
Ltd. Rates.

Paper for Department of the  
Army (Sch. No. 849). Alex.  
Cowan & Sons Ltd., £7,061/10/-;  
Gordon & Gotch (A'asia) Ltd.,  
£998/1/-; and Wiggins, Teape &  
Alex. Pirie (Export) Ltd.,  
£2,321/13/4.

Envelopes, Transparent Panel  
(Sch. No. 851). Sands & McDou-  
gall Pty. Ltd., £2,321/13/4; Wat-  
son, Ferguson & Co., £12,125/11/6;  
Spicers (Aust.) Ltd., £1,119/14/-;  
H. A. Jones & Co. Pty. Ltd.,  
£2,041/5/-.

Stationery and Rubber Goods  
(Sch. No. 852). Dunlop Rubber  
(Aust.) Ltd. Rates.

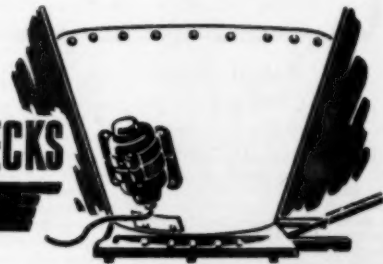
Wire Waste Paper Baskets  
(Sch. No. 852). Sands & Mc-  
Dougall. Rates.

Stationery and Rubber Goods  
(Sch. No. 852). Edwards, Dunlop  
& Co. Ltd. Rates.

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## NEW RAPID X-RAY CAMERA.

Extremely valuable new insight into normal or disturbed functional phases of the heart is provided by an X-ray camera recently developed and constructed by Swedish technicians and taking as many as 12 pictures per second simultaneously in two right-angle planes, reports *Svenska Dagbladet*. Results thus far obtained at two Stockholm hospitals point to an epoch-making advance in the technique of angiocardiographic research and diagnosis.

Thus it has been found that the heart does not function simply as a globiform mass of muscles squeezing, at the moment of contraction, the blood out in the large arterial vessels but that a piston-like effect appears at the same time in the partition between the atria and the ventricles. Furthermore, two-plane photography renders possible to a certain degree determination of the blood volume passing through the heart, as calculated from the maximum and minimum size in variation of different cavities, and the velocity of the blood stream as well as of the blood passing through the lungs. Previously it has not been possible

to observe dynamic functions of this kind. The new technique reveals whether the blood passes through each separate region with normal speed or not and, in the latter case, the cause of the circulatory disturbance.

Apart from these functional disturbances, often of the greatest importance as direct precipitators of the sufferer's condition, the two-plane film also discloses primary, perhaps organic defects such as constrictions, diastoles, faulty communications, etc., with a clarity impossible without such rapid picture sequence. Special significance is attached to the new method in connection with surgical treatment of congenital heart defects requiring the utmost accuracy in diagnosis, charting and assessment of the functional effects of organic anomalies.

## NEW CYCLOTRON.

Since its establishment in November, 1945, Sweden's Atomic Energy Commission has provided valuable support for Swedish basic research in certain fields of physics and chemistry. It appears from an exhaustive report just issued, al-

though construction of an atomic reactor will be held in abeyance for a few years yet.

Up to July 1, 1949, a total of Kr. 9,800,000 (£A 844,825) (EN.Z. 675,860) had been allocated from public funds to the Commission and the semi-Governmental enterprise A/B. Atomenergi, of which somewhat more than Kr. 6,000,000 has been used up. By way of comparison, a total of Kr. 4,000,000 was allocated in the same period via the Technical Research Council toward research in the entire technical-scientific field.

Prior to 1946, Sweden possessed, from out of all the heavy artillery of nuclear physics, one sole cyclotron and one betatron. To-day, two almost completed cyclotrons are available, one for very high intensities and energies between 25 and 30 MeV, located at the Research Institute for Experimental Physics at Frescati, near Stockholm, headed by Prof. Manne Siegbahn, Swedish Nobel laureate in physics, the other, a synchrotron, for high energies up to 200 MeV on protons

at the Gustaf Werner Institute for Nuclear Chemistry in Upsala directed by another Nobel laureate, Prof. The Svedberg. No less than five high-tension units of van de Graaff type have been constructed for the fields between 25 up to 5 MeV. Of these, three are ready while those for the highest energies, located at Lund and Gothenburg, have not yet been completed. At Stockholm's University of Technology, one betatron for 5 MeV has been completed while a cyclotron for 35 MeV is being tested out. Tests of linear accelerators are under way at the Chalmers Technical Institute. Finally, construction is completed of several high-tension installations serviceable both for high-tension X-ray tubes and neutron production.

In addition to the Defence Research Institute and the laboratories of A/B. Atomenergi, research and planning work is carried on at three different laboratories for nuclear chemistry, two institutes for theoretical physics and six institutes for nuclear physics.



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POWDERED METALS

## INCENTIVES TO HIGHER PRODUCTION.

Two prominent British industrialists emphasised during recent weeks the urgency of incentives to higher production. Sir Robert Sinclair, President of the Federation of British Industries, declared, for example: "The need in Britain to restore incentive and provide incentive is vital . . . Taxation is undermining the foundations of British industry. We must have a really determined effort to reduce Government expenditure with a lightening of the burden of taxation. We must have encouragement for the enterprise and initiative which were the true foundations of Britain's greatness."

The President of the British Employers' Federation, Sir Grenville Maginness, struck a similar note when he declared: "Incentives to higher production must be largely financial incentives—and when I talk of incentives I mean incentives, not to one section of the community only, but to all sections. One of the greatest barriers to incentive schemes is our high taxation, which largely results from Britain having compressed far-reaching reforms into a few years."

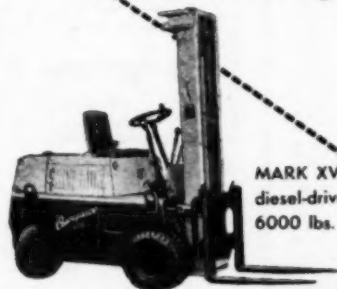
## "EQUITABLE" POWER RATIONING.

The Metal Trades Employers' Association has asked the Premier of New South Wales, Mr. McGirr, to make future regulations for the rationing of power more equitable. Urging that the metal trades should be given the greatest possible freedom from restrictions, the Association's President, Mr. H. G. Ferrier, recommended to the Premier that:—

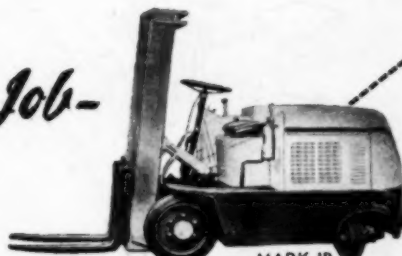
(1) That the Government make an authoritative and realistic statement regarding the possible duration and nature of power restrictions. (2) That regulations be introduced to ensure that the disability is equitably shared throughout the community and domestic users be informed that, unless they play their part, the reaction on their welfare can be most serious from the industrial angle.

The Premier has promised that the Government will carefully consider the Association's views. This is exactly as it should be. For the metal trades play a vital

# NAME YOUR Handling Job—



MARK XVI  
diesel-drive  
6000 lbs.

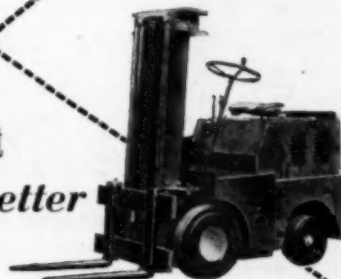


MARK IB  
petrol-electric, 4480 lbs.

## the British Conveyancer Fork Lift will do it better

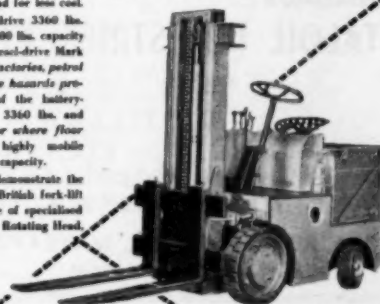


MARK VII  
petrol-drive, 2240 lbs.



MARK II—petrol-drive, 3360 lbs.

Here is the Conveyancer range—to do your handling, not only better, but faster and for less cost. For industry, generally, the petrol-drive 3360 lbs. capacity Mark II, the petrol-electric 4480 lbs. capacity Mark IB, and the 6000 lbs. capacity diesel-drive Mark XVI twin pneumatic model...for food factories, petrol depots or chemical plants where fire hazards prohibit petrol models, two models of the battery-electric Mark VI, with capacities of 3360 lbs. and 4000 lbs. . . . for confined spaces, or where floor loadings are limited, the light, highly mobile petrol-drive Mark VII with 2000 lbs. capacity. Your nearest distributor will gladly demonstrate the Conveyancer—the lowest priced All-British fork-lift truck—without obligation. Full range of specialised handling attachments including Crabs, Rotating Head, Dump, Crane etc., to fit all models.



MARK VI—battery-electric, 3360 lbs. or 4000 lbs.

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VIC. & TAS.: Power Handling (Aust.) Ltd., 20 Queen Street, Melbourne. MB 1955.

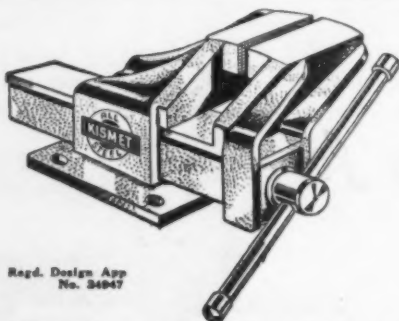
S. AUST.: Power Handling (Aust.) Ltd., 61 Gawler Place, Adelaide. Cent. 8021.

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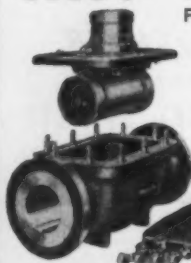
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national life.

## OFFICE-BEARERS FOR N.A.T.A.

Mr. A. E. Dawkins, B.Sc., A.R.I.C., F.A.C.I., has been appointed Chairman of the National Association of Testing Authorities, following the resignation from this position of Sir John P. V. Madsen, who will be abroad this year.

Mr. Dawkins, who is the General Superintendent of the Defence Research Laboratories, Maribyrnong, has been a member of the Council and of the Executive Committee of the Association since its inauguration, and was appointed Vice-Chairman in 1949.

Professor D. M. Myers, B.Sc., D.Sc., Eng., A.M.I.E.E., A.M.I.E. Aust., who has been appointed Vice-Chairman, joined the Council of the Association early this year. Professor Myers, formerly Chief of Division of Electrotechnology, National Standards Laboratory, now Professor of Electrical Engineering, University of Sydney, has acted as Chairman of the Electrical Testing Registration Advisory Committee of N.A.T.A. since the formation of this Committee.

## TARIFF BOARD INQUIRIES.

The Minister for Trade and Customs has referred three new matters to the Tariff Board for inquiry and report, in accordance with the Tariff Board Act, 1921-1947.

(1) Flow Meters: What rates of duty should be imposed on meters, mechanically operated, for recording the flow of petrol and oil and other liquids at present classified under Tariff Item 176(K)(2)(b).

(2) Metal Working Machine Tools: What rates of duty should be imposed on machine tools classifiable under Tariff Item 174(M)(177).

(3) Plastic Sheet: What rates of duty should be imposed on printed, polished or embossed plastic sheeting imported into Australia.

These matters will form the subjects of public inquiries at a later date.

## CONSTRUCTION INDUSTRIES' FAIR.

It has been decided definitely to hold a Construction Industries' Fair and Convention in Sydney in 1952. This decision was reached recently at a meeting presided over by the Deputy Premier of New South Wales, Mr. J. J. Cahill, those present agreeing that invitations to the Fair should be extended to leading overseas experts on water and soil conservation, hydro-electric power schemes, and highway construction.

The meeting, which was attended by heads of Government Departments associated with big national projects, and representatives of professional engineering associations, industry, materials supplies, the Building Industry Congress, and the Royal Agricultural Society of New South Wales, appointed a small committee to draw up a programme and plan details generally.

This journal hopes that the measure of support forthcoming for this project from every section of the community will be proportionate to its national significance.

## ROOTES' NEW EXECUTIVES.

Major W. H. Anderson has been confirmed as general sales manager, of Rootes Ltd., in Australia, with Mr. E. V. Murphy as commercial vehicles sales manager and Mr. L. H. Flight as assistant sales manager. These appointments were announced by the general manager, Mr. C. A. W. Laird.

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# SCHOOL FOR EXECUTIVES.

About 130 executives from all States and New Zealand are to attend a school for executives to be held at the Geelong Grammar School from May 19th to May 25th.

Organised by the department of industrial management, Melbourne Technical College, in association with the Melbourne Division of the Australian Institute of Management, this school follows a successful former one in January, 1949.

The theme would be "management - employee relations," the president of the school, Sir Herbert Gepp, said. National aspects of co-operation and its bearings on future prosperity would be discussed.

Speakers would include Mr. A. Benyon, supervisor of General Motors Holden Ltd.; Mr. H. Rabling, chairman of Vacuum Oil Co.; Mr. A. Monk, president of the A.C.T.U.; Mr. K. M. T. Powell, national secretary of the Australian Council of Employers' Federations, and Mr. H. V. Menz, managing director of W. Menz and Co. Ltd., of Adelaide.

# INSTITUTION OF ENGINEERS.

At the recent annual meeting of the Australian Institution of Engineers (Melbourne Division), the following office-bearers were elected:—Mrs. R. R. Blackwood (chairman); Mr. I. Langlands and Professor C. G. Moorhouse (vice-chairmen); Mr. C. W. Candy (secretary), and Mr. A. H. Stone (treasurer).

# Late Open Tenders

## NEW SOUTH WALES

### DEPARTMENT OF ROAD TRANSPORT AND TRAMWAYS.

Axles (400) and (73) pairs of wheels and axles, total weight of approx. 70 tons. May 13.

### MISCELLANEOUS.

Centrifugal Pumping Units (self-contained), for Snowy Mountains Hydro Electric Authority. May 9.

Crawler Tractor, approx. 40 h.p., weight 9,800 lb., to be fitted with an Angle Dozer and an Automatic Tractor Wheel Scoop, for Liverpool Plains Shire. May 11.

Steel Framed Crab Winches (2-ton capacity), twelve (12); Beam Pumps (6), for Dewatering, 3,000 galls. per hour capacity, for Snowy Mountains Hydro Electric Authority. May 9.

## VICTORIA

### MELBOURNE AND METROPOLITAN BOARD OF WORKS.

Candles, Soap, etc. May 9.  
Fire Plug Balls. May 9.  
Galvanised Sheet, Iron Pipes and Cows. May 9.

India Rubber Goods. May 9.

Irregular Castings. May 9.

Liquid Fuel. May 9.

M.S. "U" Bolts. May 9.

M.S. Elevated Tank (10,000 gall.). May 23.

Plumbers' Sundries. May 9.

Rope, Cordage and Yarns. May 9.

Trailer Shelters (30), 14 ft. x 8 ft. May 9.

Workshop Equipment—Milling Machine, Grinders, Lathes, Electric and Hydraulic Hoists, etc. May 23.

### GOVERNMENT RAILWAYS DEPARTMENT.

Ball Bearings, for 70 ft. Turntables. May 17.

Bedside Tables. May 10.

Hacksaw Machine, high speed May 10.

Water Cooler. May 10.

### MELBOURNE HARBOUR TRUST.

M.S. Reinforcing Rounds (300 tons), of 1½ inch diameter. May 5.

### MISCELLANEOUS.

Chlorination Equipment, for Romsey Water Works Trust. May 1.

Vitrified Stoneware Pipes (6-inch dia.), 1,095 lin. ft., and seven (7) Manholes, for Nhili Sewerage Authority. May 1.

## SOUTH AUSTRALIA

### GOVERNMENT RAILWAYS DEPARTMENT.

Pneumatic Tyred Mobile Crane. May 4.

### DEPARTMENT OF RAILWAYS—NEW SOUTH WALES.

TENDERS enclosed in sealed envelopes which must be endorsed "TENDER FOR . . .", addressed to the Commissioner for Railways, 19 York Street, Sydney, will be received on date and time shown for services specified. Tenders may be lodged in the Tender Box, Room 504A, 8th Floor, Railway House, 19 York Street, Sydney, or posted to the above address.

Wednesday, 17th May—  
12 noon.

Carrying out Earthworks for Railway Extension from Awaba to Lake Macquarie Power Station (Wangi) between mileages 2m. 58ch. and 6m. 52ch. Plans and specification obtainable, price 2/6 per set, from Chief Civil Engineer, (Construction Section), 13 York Street, Sydney, and Railway Maintenance Engineer, Civic Railway Station, Newcastle.

No tenders necessarily accepted. Make cheques payable to Commissioner for Railways. Any tender unaccompanied by deposit as provided in conditions of contract may be rejected.

S. R. NICHOLAS,  
Secretary for Railways.

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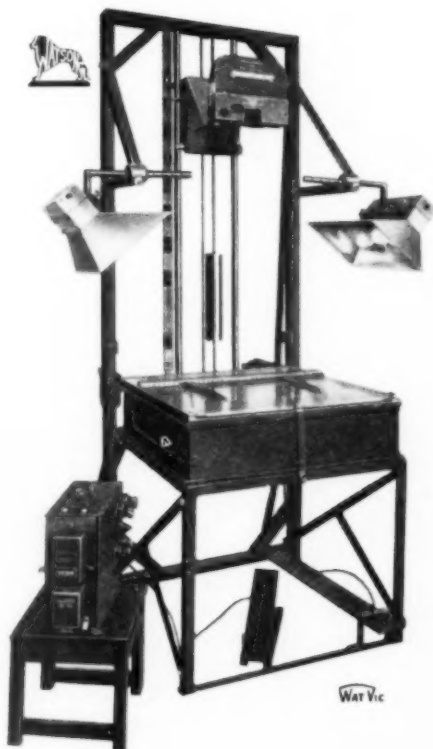
Orion Chemical Products Pty. Ltd. Sydney

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Science has a vital role in the steel industry, ensuring that steel products meet their specifications and developing new steels. Here in Rylands Bros.' metallographic laboratory at Newcastle, technical trainees standardise a Vickers hardness testing machine (foreground) and examine a spring sample under the binocular microscope.



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The door is wide open to boys who want interesting careers; who want to be qualified engineers, chemists or metallurgists.

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The Staff Training Officer of any of the following Companies will be glad to furnish you with further details of career opportunities in the steel industry:

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